Meridian 1 and Succession Communication Server for Enterprise 1000

International ISDN Primary Rate Interface

Feature description and administration

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There have been additions made to this document. Information pertaining to Feature overview, Operating parameters, Feature interactions, Feature packaging, and Feature operation is now included with the original Feature administration information. As well, the Engineering and configuration guidelines are now part of this document. Accordingly, the title of this

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About this document

This document provides an introduction to the Integrated Services Digital Network (ISDN) and a description of the features available on the Meridian 1 Internet Enabled and Succession Communication Server for Enterprise 1000 systems with ISDN Primary Rate Interface (PRI). The document also contains a chapter describing ISDN Basic Rate Interface (BRI) feature support on the Meridian Internet Enabled and Succession CSE 1000 systems.

The feature modules in this publication contain the following information:

- ***Description*** explains how the feature operates and what it is designed to do.
- ***Operating parameters*** describe the special requirements that pertain to the function of the feature.
- ***Feature interactions*** describe how the feature interacts with other Meridian 1 features.
- ***Feature packaging*** describes the software packaging requirements that are necessary to operate the feature.
- ***Feature administration*** describes the steps required to configure the feature in software. In this section, responses in parentheses are the default responses. Also, only the prompts relevant to defining the application are shown.
- ***Feature operation*** provides any user instructions necessary for the operation of the feature, if applicable.

This document is a global document. Contact your system supplier or your Nortel Networks representative to verify that the hardware and software described is supported in your area.

ISDN product overview

Contents

The following are the topics in this section:

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Regional material statement

The information presented in this section does not pertain to all market regions. Contact your system supplier or your Nortel Networks representative to verify support of this product in your area.

Integrated Services Digital Network

Integrated Services Digital Network (ISDN) is a recommended standard for digital communications. ISDN provides standard digital interfaces between telephones, terminals, and telecommunications networks.

ISDN uses a common signaling protocol transmitted over a dedicated data channel called the D-channel. The D-channel carries call set-up and feature-activation information to the call destination. This allows users to have access to network-wide features.

ISDN services are categorized into two types of interfaces, Primary Rate and Basic Rate.

ISDN Primary Rate Interface (PRI), provides 23B+D (T-1 carriers) or 30B+D (E-1 carriers) digital connectivity between the Meridian 1 or Succession Communication Server for Enterprise 1000 and the following interfaces:

- host computers
- other Meridian 1 and Succession CSE 1000
- SL-100
- DMS-100, DMS-250
- QSIG

ISDN PRI 30B+D access is provided to the following Central Office connectivities:

- Australia ETSI
- AXE-10 (Sweden and Australia)
- SwissNet
- NEAX-61
- SYS-12
- Numeris VN3
- 1TR6
- NET-3 and ETS 300 403 (EuroISDN)
- Asia Pacific

ISDN protocol overview

ISDN protocols govern the format, timing and sequencing used to exchange data and control information between two terminal stations connected through an ISDN network.

These protocols are based on a model containing seven layers of protocol developed by the International Standards Organization (ISO). This seven-layer model, called the Open Systems Interconnection model, has been adopted by the International Telegraph and Telephony Consultative Committee (CCITT). It is the basis for building protocol structures for ISDN service. ISDN currently uses four of the seven layers:

- layer 1—physical layer
- layer 2—link layer
- layer 3—network layer
- layer 7—application layer

Each layer uses the series of services provided by the layer beneath it, and builds on these services to perform a communications function for the layer above. For example, layer two builds on the services from layer one and provides the combined services to layer three. This layered approach splits the complex protocols into a series of easily managed blocks, each of which can be modified without affecting protocols in another layer.

Layers one through three control the set-up of connections. These layers also supervise the transmission of information between terminals and the packet -switched and circuit-switched networks.

The PRA protocol layers are implemented on Meridian 1 and Succession CSE 1000 as follows:

- Layer 1 (the Physical Layer) is handled by the Primary Rate Interface (PRI) card.
- Layer 2 (the Link Layer) is handled by the D-channel Interface.
- Layer 3 (the Network Layer) is handled by Meridian 1 or Succession CSE 1000 software.
- Layer 7 (the Application Layer) is also handled by Meridian 1 or Succession CSE 1000 software.

The Application Layer uses the Transaction Capability Application Part (TCAP) and the Remote Operation Service Element (ROSE) to process applications. The transport of applications has three main parts:

- a simple interface allowing applications to send and receive data

- a non-call-associated supplementary service to handle TCAP remote operation
- a call-associated supplementary service to handle ROSE remote operation

Note: ROSE messaging is supported for call-associated messages; TCAP messaging is supported for non-call-associated messages.

ISDN Primary Rate Interface

ISDN PRI provides the interface between a customer's equipment and the public and private network, and allows basic call services and network business services capabilities across the public and private networks.

The characteristics of PRI provide a standard digital interface that supports the Q.931 protocol, as recommended by the International Telegraph and Telephony Consultative Committee (CCITT). This protocol is a message-oriented out-of-band signaling protocol that provides telephony, data and supplementary services. The PRI architecture allows continued growth in operations, maintenance and network business services.

Primary Rate Interface structure

The Primary Rate Interface is structured as a collection of digital, 64 kbps channels. One channel is required for D-channel signaling information. The other channels are for user voice and data transport and are referred to as Bearer Channels or B-channels.

The physical (layer 1) specification for the Primary Rate Interface supports the standard electrical characteristics and frame structures of the 1.5 Mb T-1 or 2.048 Mb E-1 digital carrier. Therefore, the PRI can have up to 23 or 30 B-channels and one D-channel.

nB+D Primary Rate Interface

Although the PRI layer 1 specifies the protocol for 23B+D or 30B+D interface structures, layer 3 supports signaling for a “larger” PRI, in the form of the nB+D Primary Rate Interface.

In this configuration, one active D-channel can provide signaling support for all the B-channels contained on a maximum of 16 digital carriers (384 B-Channels for T-1 carriers or 480 B-channels with E-1 carriers). The following notes pertain to the nB+D configuration.

Note 1: nB+D PRI is only provided on the interfaces that support it, as described in the feature modules throughout this document. Also, the maximum number of digital carriers can be constrained by the switching device on the far end of the link. To determine the constraints in your market, consult your local Nortel Networks representative. Also note that the maximum number "n" in nB+D configurations is subject to trunk route limitations.

Note 2: For nB+D PRI, the actual D-channel configuration can depend on market-specific requirements. Also, the backup D-channel can reside on the first or second carrier in some markets.

Note 3: If the maximum number of carriers is configured for nB+D (that is, 16), then it is assumed that the configuration includes a backup D-channel. In configurations with less than 16 carriers, a backup D-channel is not required, but is recommended.

ISDN Signaling Link Interface

The CCITT currently limits the Layer 1 ISDN protocols to digital facilities only. Some customer applications can be met more effectively with analogue facilities. Meridian 1 and Succession CSE 1000 Networking offers customers this flexibility in the form of the ISDN Signaling Link (ISL) interface.

The ISL interface is a configuration unique to Meridian 1 and Succession CSE 1000 Networking for:

- Meridian 1 or Succession CSE 1000 to Meridian 1 or Succession CSE 1000 systems.

  Note: The ISL interface is not supported on any other private exchange, and no public exchange at all, due to the lack of standardization for ISL.

It extends the advantages of ISDN signaling to locations served by analogue or digital facilities.

The ISL interface is structured as a collection of analogue and/or digital trunks, and can operate under two basic modes of operation: shared and dedicated. ***Shared mode*** requires a PRI (either 30B+D, or nB+D) between originating and terminating switches. The ISDN D-channel is used to provide out-of-band signaling for both the ISDN and non-ISDN trunks. ***Dedicated mode*** is appropriate when no PRI exists between originating and terminating switches or when it is not desirable to share an ISDN D-channel as described above. In this mode of operation, a dedicated D-channel is established between originating and terminating switches. The signaling information for the selected, non-ISDN trunks is transported through this link.

The signaling connection is a data circuit which can be established over a leased line, multiplexed facilities, or an existing trunk circuit using standard data communications equipment such as modems, multiplexers, or Meridian 1 and Succession CSE 1000 data adapters.

In the case of a failure on this link, signaling operation reverts to conventional inband signaling. This is a major advantage of the ISL interface.

Reverting to conventional trunk signaling

This feature handles ISL trunk calls by reverting to conventional trunk signaling when the primary and backup D-channels become inactive.

When a primary and backup D-channel go down:

- established ISL calls remain established, regardless of the signaling method used
- transient ISL calls that are set up using conventional trunk signaling are not disturbed
- transient ISL calls that are set up by D-channel signalling are dropped. The user must re-initiate the call. Then, conventional trunk signaling is used if the D-channel remains inactive.
- ISL channels are not marked “maintenance busy”

There are two scenarios that can occur when a D-channel is re-established, one with backup D-channel and one without.

When a D-channel with backup re-establishes

- there is no impact. The primary D-channel simply recovers. ISL calls, still using D-channel signaling (in existing software), can bypass the restart procedure.

When a D-channel without backup re-establishes

- transient and established ISL calls that are set up using conventional trunk signaling are not disturbed.
- established ISL calls that are set up using D-channels are disconnected.
- to disconnect an established ISL call, the system uses the same signaling method with which the call was setup.

Backup D-channel

In situations where the reliability of the D-channel signaling is critical, each of the PRI, nB+D PRI, and ISL interfaces can be configured so that there is one active and one ***backup D-channel***. If the active D-channel fails, then D-channel processing switches over to the backup D-channel.

When dealing with standard 30B+D PRI structures, it is necessary to have at least two PRIs in order to provide a backup D-channel. The backup D-channel is installed and configured the same way as the primary D-channel. Note, however, that when configuring primary and backup D-channels on a system, the backup D-channels must be programmed the same as the primary D-channels and must be connected to the same card type.

Connection parameters

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Connection parameters for 2.0 Mb PRI

This section describes the major parameters that must be coordinated between the Meridian 1 or Succession Communication Server for Enterprise 1000 and the far end facility, over a 2.0 Mb ISDN PRI connectivity. These parameters are as follows:

- **Frame formats** for the 2.0 Mb data stream are:
  - — Alternate frame format
  - — CRC 4 multiframe format
- **Line encoding** for the 2.0 Mb data stream is:

— HDB3 coding, a modified form of Alternate Mark Inversion (AMI), for zero code suppression

Note: (Line coding is bipolar for 2Mb/s line transmission.)

- **Error detection** on the 2.0 Mb data stream consists of:
  - — Remote alarm detection
  - — Bit error rate monitoring
  - — Frame alignment monitoring
  - — Frame slip detection
- **Data rate parameters:**
  - — 64 Kbps clear
- **Channel parameters:**
  - — B-channels
  - — D-channels
- **Interface protocols** for Meridian 1 and Succession CSE 1000 to Meridian 1 and Succession CSE 1000 connections:
  - — slave to master

Frame formats

The CEPT basic format consists of 32 8-bit bytes with one byte per channel. This makes a total of 256 bits per frame. The nominal bit rate of the signal is 2.0 Mb and the sampling rate for each channel is 8000 Hz.

Alternate frame format

The alternate frame format includes the following framing/control bit patterns in timeslot 0:

- FAS: Bits at position 2 to 8 in even frames constitute the FAS. This is in the form 0011011.

- Si bit: The Si bit is always **1** in transmission, and is ignored in reception.
- A bit: This bit is used for Remote Alarm Indication (RAI).

Table 1
Alternate frame formats

	Bit number							
Alternate frame	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Even frame	Si	0	0	1	1	0	1	1
Odd frame	Si	1	A	Sa_4	Sa_5	Sa_6	Sa_7	Sa_8

CRC 4 Multiframe Format

The CRC4 multiframe format includes the following framing/control bit patterns in timeslot 0:

- Multiframe Alignment Signal (MAS): Bits 1 in frames 1, 3, 5, 7, 9, and 11 constitute MAS. This signal is in the form of 001011.
- CRC bits: C1, C2, C3, and C4 constitute the CRC bits.
- Si bits: The NT8D72AA card can be configured in software to use the Si bit in one of two ways. The Si bit can be left as **1** during all transmission, or it can be set to **0** when a CRC-4 error arises during transmission.
- Sa bits, A bit, and FAS: The use of these bits is the same as in the Alternate Frame.

Table 2
CRC 4 Multiframe Format table (Part 1 of 2)

Sub-multiframe	Frame number	Bit number							
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
	0	C1	0	0	1	1	0	1	1
	1	0	1	A	Sa_4	Sa_5	Sa_6	Sa_7	Sa_8
	2	C2	0	0	1	1	0	1	1

Table 2
CRC 4 Multiframe Format table (Part 2 of 2)

I	3	0	1	A	Sa_4	Sa_5	Sa_6	Sa_7	Sa_8
	4	C3	0	0	1	1	0	1	1
	5	1	1	A	Sa_4	Sa_5	Sa_6	Sa_7	Sa_8
	6	C4	0	0	1	1	0	1	1
	7	0	1	A	Sa_4	Sa_5	Sa_6	Sa_7	Sa_8
	8	C1	0	0	1	1	0	1	1
	9	1	1	A	Sa_4	Sa_5	Sa_6	Sa_7	Sa_8
	10	C2	0	0	1	1	0	1	1
	11	1	1	A	Sa_4	Sa_5	Sa_6	Sa_7	Sa_8
II	12	C3	0	0	1	1	0	1	1
	13	Si_1	1	A	Sa_4	Sa_5	Sa_6	Sa_7	Sa_8
	14	C4	0	0	1	1	0	1	1
	15	Si_2	1	A	Sa_4	Sa_5	Sa_6	Sa_7	Sa_8

Line encoding

Line coding for CEPT is bipolar. A modified form of Alternate Mark Inversion (AMI) is used, and is called High Density Bipolar 3 (HDB3) coding (see below). The general requirements for CEPT code suppression is a maximum of 3 consecutive zero binary bits.

To meet the maximum and minimum requirements, PRI provides HDB3 zero-code substitution techniques as options.

HDB3 coding

This is a coding scheme used for bipolar alternate-mark-inversion digital transmission which replaces any sequence of four consecutive zeros with a unique code containing a bipolar violation (BPV). The unique sequence is (*X*,0,0,*BPV*) where *X* is set to either a one or a zero to ensure that the bipolar violation is of opposite polarity to the previous BPV. This maintains the DC balance of the line.

Error detection

Remote alarm

Remote alarm transmission

A remote alarm indicates that the far end (the remote switch) is not ready. If the PRI is receiving the remote-alarm pattern, it indicates that there is in fact a 2.0 Mb digital line connection. (That is, transmission integrity is good, and the problem exists at the far end.)

When the PRI receives a remote-alarm signal from the far end, all 30 B-channels are disabled.

Remote alarm method

The **A** bit is used for Remote Alarm Indication (RAI). When the Meridian 1 or Succession CSE 1000 software informs the card about an alarm indication, the card sets the **A** bit to one during transmission. This is a signal to the remote end of an alarm condition. If there is no alarm, the 2.0 Mb PRI sets the **A** bit to zero during transmission.

Upon reception of an **A** bit equal to one, the PRI informs the Meridian 1 or Succession CSE 1000 that an RAI has been received.

Channel restoration

When the PRI stops receiving the remote alarm, the 30 B channels are placed into the idle state and made available for calls.

Each time a remote alarm is generated, a counter is incremented. Remote alarm is cleared immediately upon the reception of a cleared message from the card.

Bit error rate

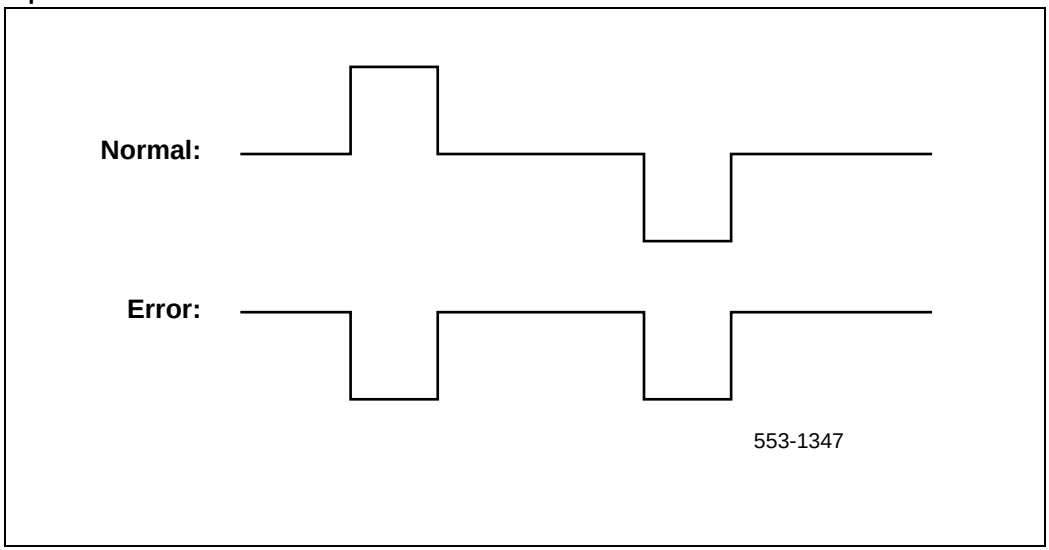
Bit error-rate monitoring detects errors in transmission. There are two methods of bit error-rate monitoring, bipolar violation tracking (BPV) and cyclic redundancy check (CRC).

Bipolar violations (BPV)

In a bipolar pulse stream, transmitted pulses alternate in polarity. A bipolar violation has occurred if two pulses of the same polarity are received in succession (this could be caused by an electrical disturbance, such as noise). See Figure 1.

Note: Some bipolar violations are normal when using the HDB3 coding.

Figure 1
Bipolar violations



Cyclic redundancy check (CRC)

The CRC 4 Multiframe Frame format contains a checksum of all the data in the frame. The receiving side uses the checksum to verify that the data is error free.

The primary functional difference between BPV and CRC is that BPV indicates physical errors limited to the local span, while CRC indicates errors on an end-to-end span. For example, a satellite link BPV only detects errors in the span between the Meridian 1 or Succession CSE 1000 and the satellite connection. Since CRC traverses the entire span, it detects errors from the Meridian 1 or Succession CSE 1000 through to the far end switch, indicating an end-to-end bit error rate.

Bit error rate thresholds

PRI hardware detects BPV and CRC errors. Running the midnight routines, prints the number of overflows and clears the counter. The printout shows a total error count for each of the error types.

These are the bit error rate thresholds set in LD 73. The error counters are printed by way of LD 60.

```
PRI2 LOOP  L
     MNTNNDCNNCOOS

BPV- xxxxxxxxxxxx
FAP- xxxxxxxxxxxx
SLP- xxxxxxxxxxxx
CRC- xxxxxxxxxxxx
G2 -  xxxxxxxxxxxx
```

```
                    MAINTNONEWCALL UNAVAIL SEVERE

TOTAL 24HR BPV- xxxxxxxxxxxxxxxxxxxxxxxxxxx     xxxxxxxxx
TOTAL 24HR CRC- xxxxxxxxxxxxxxxxxxxxxxxxxxx     xxxxxxxxx
TOTAL 24HR FAP- xxxxxxxxxxxxxxxxxxxxxxxxxxx     xxxxxxxxx
TOTAL 24HR SLPREP- xxxxxxxxx
TOTAL 24HR SLPDEL- xxxxxxxxx
TOTAL 24 HOUR G2 AIS  -  xxxxxxxxx
TOTAL 24 HOUR G2 LFAS  -  xxxxxxxxx
TOTAL 24 HOUR G2 LMAS  -  xxxxxxxxx
TOTAL 24 HOUR G2 RAI  -  xxxxxxxxx
TOTAL 24 HOUR G2 LOS  -  xxxxxxxxx
```

Frame alignment

Loss-of-frame-alignment monitoring detects out-of-frame conditions on the 2.0 Mb bit stream.

Loss of frame alignment thresholds

PRI hardware detects out-of-frame conditions. Running the midnight routines, prints the number of loss-of-frame-alignment occurrences and clears the counters.

If a loss-of-frame-alignment condition persists for three seconds, the affected PRI loop is taken out of service and a local alarm is raised. If the loss-of-frame-alignment condition clears for at least 15 seconds, the PRI is automatically restored to service. Three frame-alignment thresholds are set in LD 73. Setting FAP to zero enables automatic recovery.

FAP aa bb

where:

aa is maintenance threshold range 1-(28)-255

bb is out-of-service threshold range (1)-255

(Default values for these parameters are shown in brackets.)

Frame slip

Digital signals must have accurate clock synchronization for data to be interleaved into or extracted from the appropriate timeslot during multiplexing and demultiplexing operations. Frame-slip monitoring detects frame-deletion and repetition errors in clock synchronization.

Clock synchronization can track on either a primary or a secondary reference clock, or it can operate in free-run (non-tracking) mode. In LD 73 (prompts PREF and SREF), one PRI may be defined as the primary clock reference. Another may be defined as the secondary clock reference. All others are defined as free running.

Thresholds

PRI hardware detects frame slips in a tracking reference clock, or in the free-run mode. Running the midnight routines, prints the number of overflows and clears the counters.

There are two slip thresholds set in LD 73.

SLP aa bbX cc ddX

where:

aa is maintenance threshold slip count; range 1-(5)-255

bbX is maintenance threshold time (see below)

cc is out-of-service threshold slip count; range 1-(30)-255

ddX is out-of-service threshold time (see below)

Threshold times may be entered in milliseconds (*X*=**T**), seconds (*X*=**S**), minutes (*X*=**M**) or hours (*X*=**H**). For milliseconds, *bb* or *dd* are multiples of 20 ms, in the range 1 to 5000 (effective time range of 20 to 5000 ms). For seconds, *bb* or *dd* are in increments of seconds, in the range 1 to 240. For minutes, *bb* or *dd* are in increments of minutes, in the range 1 to 240. For hours, *bb* or *dd* are in hour increments, in the range 1 to 24.

Channel parameters

B-channels

To minimize glare situations, Meridian 1 and Succession CSE 1000 allocates B-channels from logical channel 30 down to logical channel 1.

Outgoing trunk hunting on B-channels should be set for the round-robin searching method, rather than the linear method. This way, when the switch is looking for an outgoing idle trunk, it will look for the next lower available trunk member, rather than the last member that was used.

The B-channel network loop, 0-159, and the PRI channel number, 1-30, are defined in LD 14.

D-channels

The D-channel location must be coordinated with the far end.

To establish the PRA link, the D-channel interface port number and PRI loop numbers are associated in LD 17. The DCHI port number must be an odd number, 1 through 15. PRI loop numbers may be between 0 and 159.

For information on the implementation of the Multi-purpose Serial Data Link (MSDL) DCH Handler feature, which allows a Meridian 1 or Succession CSE 1000 to support up to 64 D-channels, refer to *Multi-purpose Serial Data Link*.

Interface protocols

The interface protocol between a Meridian 1 or Succession CSE 1000 and another Meridian 1 or Succession CSE 1000, is a user-to-user protocol. Call processing uses a master-slave relationship for glare resolution.

One Meridian 1 or Succession CSE 1000 must be designated as the master and the other as the slave (in LD 17). If the master side of the interface sends a SETUP message, as the slave initiates an outgoing call, priority is given to the call sent from the master switch. The outgoing call on that channel, the call initiated by the slave, will be dropped and another virtual B-channel will be selected for call origination.

Connection parameters for 1.5 Mb PRI

This section describes the major parameters that must be coordinated between the Meridian 1 or Succession CSE 1000 and the far end facility, over a 1.5 Mb ISDN PRI connectivity. These parameters are as follows:

- Frame format

  - Superframe format
  - Extended superframe format
- Line encoding
  - B7 coding
  - B8ZS coding
- Error detection
  - Yellow alarm (remote alarm)
  - Bit error rate
  - Frame alignment
  - Frame slip
- Data rate parameters
  - 56 kbps inverted
  - 64 kbps clear and restricted
- Channel parameters
  - B-channels
  - D-channels
- Interface protocols
  - User to network
  - Symmetric

Frame formats

The DS-1 basic format consists of 24 8-bit bytes with one byte per channel and one framing bit, or F-bit. This makes a total of 193 bits per frame. The nominal bit rate of the DS-1 signal is 1.544 Mbps and the sampling rate for each channel is 8000 Hz.

Superframe format

A superframe format, the standard format, consists of 12 DS-1 frames (see Table 3). It is consistent with the channel bank formats D2, D3, and D4. The signaling bit is time-shared to identify both the channel and the signaling frame. The framing pattern is the repeated sequence 100011011100.

Channel framing identifies the location of timeslot 1. The signaling frame identifies those frames in which two signaling states, A and B, are transmitted on a time-shared basis. The assignments of the F-bit and the A and B bits in the superframe format are shown in Table 3.

Table 3
The superframe format table

Frame number	F-Bit		PCM coding bits	Signaling bit	Signal channel
	Terminal framing	Signaling framing			
1	1	—	1–8		
2	—	0	1–8		
3	0	—	1–8		
4	—	0	1–8		
5	1	—	1–8		
6	—	1	1–7	8	A
7	0	—	1–8		
8	—	1	1–8		
9	1	—	1–8		
10	—	1	1–8		
11	0	—	1–8		
12	—	0	1–7	8	B

Note: The most significant bit is defined as bit 1 and the least significant bit as bit 8.

Extended superframe format

The Extended superframe format (ESF) consists of 24 frames. The 8 kbps F-bit channel is divided into three separate channels.

Framing Pattern Sequence (FPS)

Beginning with frame 4 or ESF bit 579, the framing bit of every fourth frame forms FPS 001011, which is used to determine the mainframe, superframe, and robbed bit signaling synchronization. This sequence is a 2 kbps channel.

Facility Data Link (FDL)

This is a 4 Kbps channel, used to turn on a yellow alarm. Meridian 1 and Succession CSE 1000 system software uses FDL to convey yellow alarm (remote alarm) information or to transmit all 1s, as selected in service change.

Cyclic Redundancy Check (CRC)

The CRC sequence is a 2 kbps channel. CRC indicates one or more bit errors in a block, or bits from the received bit stream. CRC can be used as an end-to-end bit error rate indicator.

The assignments of the F-bit and the A, B, C, and D bits in ESF are shown in Table 4.

Table 4
Extended superframe format table (Part 1 of 2)

Frame number	F-Bit				Robbed bit signaling
	Bit number	Assignments			
		FPS	FDL	CRC	
1	0	—	m	—	
2	193	—	—	CB1	
3	386	—	m	—	
4	579	0	—	—	
5	772	—	m	—	
6	965	—	—	CB2	A

Table 4
Extended superframe format table (Part 2 of 2)

Frame number	F-Bit				Robbed bit signaling
	Bit number	Assignments			
		FPS	FDL	CRC	
7	1158	—	m	—	
8	1351	0	—	—	
9	1544	—	m	—	
10	1737	—	—	CB3	
11	1930	—	m	—	
12	2123	1	—	—	B
13	2316	—	m	—	
14	2509	—	—	CB4	
15	2702	—	m	—	
16	2895	0	—	—	
17	3088	—	m	—	
18	3281	—	—	CB5	C
19	3474	—	m	—	
20	3667	1	—	—	
21	3860	—	m	—	
22	4053	—	—	CB6	
23	4246	—	m	—	
24	4439	1	—	—	D

Line encoding

Line coding for DS-1 is bipolar, Alternate Mark Inversion (AMI). The general requirements for DS-1 code suppression are:

- a maximum of 15 consecutive zero binary bits
- a minimum average of 12.5 percent density of one binary bit over any 192 consecutive bits

To meet the maximum and minimum requirements, PRI provides B7 and B8ZS zero code substitution techniques as options.

B7 coding

B7 coding restricts the D-channel operating modes to 56 kbps or 64 kbps inverted (64 KI).

When all eight PCM bits in a channel are 0 and the eighth bit is not a signaling bit in state one, the seventh bit is substituted by a 1. This means zero code suppression is done on a per byte basis.

> ***Note:*** Do not invoke the seventh bit substitution when digital data is being transmitted as this causes data corruption.

B8ZS coding

The B8ZS coding format supports 64 kbps clear channel (64 KC) or 64 kbps inverted HDLC (64 KI).

When eight consecutive 0s appear on a channel and the last bit transmitted is positive, the eight bits are substituted by the following pattern:

Substituted word 0 0 0 +1 –1 0 –1 +1

If the last bit was negative, the polarity is reversed. This results in the following substituted word:

Reverse polarity 0 0 0 –1 +1 0 +1 –1

Bipolar violations occur in the fourth and seventh bit positions of the inserted code. Therefore, B8ZS coding can be used only when the receiving end is capable of recognizing that these are not bipolar violations or bit errors.

Error detection

This section describes the ISDN error detection. There are four types of error detection:

- yellow (remote) alarm
- bit error rate
- frame alignment
- frame slip

Yellow alarm (remote alarm)

A yellow alarm signal (received by the near end) indicates that the far end (the remote end) is not ready. If the PRI is receiving the yellow alarm pattern, it indicates that there is a T1 connection. When the PRI receives a yellow alarm signal from the far end, all 24 channels are disabled.

The yellow alarm method used depends on the framing format (D2, D3, D4, or ESF) selected. If D2, D3, or D4 framing formats are chosen, Digit 2 yellow alarm is automatically selected by software. If the ESF framing format is chosen, the yellow alarm method must be set through service change.

- Digit 2 (DG2) yellow alarm signaling is provided by external circuitry. This alarm is detected when each digit 2 in 63 contiguous channels is logic zero. Use DG2 yellow alarm signaling with D2, D3, and D4 frame formats in Canada and the U.S. Also use DG2 yellow alarm signaling with the ESF frame format in Canada, in compliance with Canadian standard CS03.
- Facility Data Link (FDL) yellow alarm signaling is a 4 kbps channel. In the U.S., use FDL yellow alarm signaling when the ESF frame format is selected.

When the PRI stops receiving the yellow alarm, channels are placed into the idle state and made available for calls. (In comparison, TIE trunks using A&B bit signaling are made to match the state of the far end, as presented by the T1 port.)

Each time a yellow alarm is generated, a counter is incremented. When the remote alarm 24-hour threshold (prompt RALM in LD 73) is reached, the PRI must be restored to service manually.

Bit error rate

Bit error rate monitoring detects errors in transmission. There are two methods of bit error rate monitoring: bipolar violation tracking and cyclic redundancy check (CRC). If the D2, D3, or D4 framing format is selected in LD 17, prompt DLOP, bipolar violation tracking is implemented. If the extended superframe format (ESF) is selected, CRC is implemented.

Bipolar violations (BPV)

In a bipolar pulse stream, pulses alternate in polarity. A bipolar violation has occurred if, after transmission, two pulses of the same polarity are received in succession (this could be caused by an electrical disturbance, such as noise). See "Bipolar violations" on page 28.

Note: Some bipolar violations are normal when using the B8ZS coding.

Cyclic redundancy check (CRC)

The extended superframe (ESF) format contains a checksum of all the data in the frame. The receiving side uses the checksum to verify that the data is correct.

The primary difference between BPV and CRC is that bipolar violations indicate errors on the local span, while CRC indicates errors on an end-to-end span. For example, on a satellite link, BPV only detects errors in the span between the Meridian 1 or Succession CSE 1000 system and the satellite connection. Since CRC traverses the entire span, it detects errors from the Meridian 1 or Succession CSE 1000 system to the satellite connection, then to the far end connection, indicating an end-to-end bit error rate.

Bit error rate thresholds

PRI hardware detects BPV or CRC errors. It sends an overflow (OVFL) message to the Meridian 1 or Succession CSE 1000 CPU each time 1024 BPV or CRC errors are detected. Running the midnight routines prints the number of overflows and clears the counter.

There are three bit error rate thresholds set in LD 73. Setting BIPC to zero enables automatic recovery.

BIPV	1–(3)–4	maintenance threshold
	1–(2)–4	out-of-service threshold
BIPC	0–(2)–128	maximum number of times a DTI/PRI loop can be taken out of service in 24 hours

Note: The BIPV values determine the sensitivity of the loop to errors, where BIPV = 1 is the least tolerant to errors, and BIPV = 4 is the most tolerant.

Frame alignment

Loss of frame alignment monitoring detects out-of-frame conditions on the DS-1 bit stream.

Loss of frame alignment thresholds

PRI hardware detects out-of-frame conditions. Running the midnight routines prints the number of loss of frame alignment occurrences and clears the counters.

If a loss of frame alignment condition persists for 3 seconds, the affected PRI loop is taken out of service and a red alarm (local alarm) is raised. If the loss of frame alignment condition clears for at least 15 seconds, the PRI is automatically restored to service. Three frame alignment thresholds are set in LD 73. Setting LFAC to 0 enables automatic recovery.

LFAL	1–(17)–10240	maintenance threshold
	1–(511)–10240	out-of-service threshold
LFAC	0–(3)–128	24–hour out of service limit

Frame slip

Digital signals must have accurate clock synchronization for data to be interleaved into or extracted from the appropriate timeslot during multiplexing and demultiplexing operations. Frame slip monitoring detects frame deletion and repetition errors in clock synchronization.

Clock synchronization can either track on a primary or secondary reference clock, or operate in free run (nontracking) mode. In LD 73 (prompts PREF and SREF), one PRI can be defined as the primary clock reference. Another can be defined as the secondary clock reference.

Tracking mode

PRI hardware detects frame slips in a tracking reference clock. Running the midnight routines prints the number of overflows and clears the counters.

There are two thresholds set in LD 73.

SRTK	1–(5)–24	maintenance threshold (elapsed time in hours between frame slips)
	1–(30)–3600	out-of-service threshold (number of slips per hour)

Automatic recovery

After the tracking mode (SRTK) or nontracking mode (SRNT) out-of-service thresholds (the second value for these prompts) are exceeded, the slip rate is monitored for improvement. When the slip rate has improved, the trunks are returned to service.

There are two parameters set in LD 73:

SRIM	(1)–127	improvement timer in minutes
SRMM	1– (2)–127	improvement criteria

If the nontracking mode maintenance threshold (the first value for SRNT) does not exceed SRMM in the duration of SRIM, then the trunks are returned to service. If not, the timer is restarted and monitoring continues.

Frame slippage is considered less important than alarms for loss of frame alignment persisting for 3 seconds, remote alarm, and bipolar violations exceeding the out-of-service threshold. If any of these alarms are reported while the slip rate is being monitored for improvement, then the monitoring stops. The trunks are returned to service only when the more serious alarm clears.

Free run (nontracking) mode

PRI hardware detects frame slips in the free run mode. Running the midnight routines prints the number of frame deletions and repetitions and clears the counters.

Data rate parameters

ISDN uses three types of data rates 56 kbps inverted, 64 kbps clear, and 64 kbps restricted.

56 kbps inverted

A 56 kbps channel is specified with the Bearer Capability Information Element (IE).

- The information transfer capability is set to restricted digital information.
- The information rate is set to 56 kbps.
- The layer and protocol identification in octet 5 is set to user information layer 1 protocol, rate adaptation, and the rate is encoded as 56 kbps.

64 kbps clear and restricted

The 64 kbps restricted (inverted HDLC), or 64 kbps clear (64C) is specified in the Bearer Capability IE in the SETUP message.

The 64 kbps restricted switched connections are supported by the Meridian 1-to-DMS-100 protocol and the Succession CSE 1000-to-DMS-100 protocol.

The Meridian 1 or Succession CSE 1000 to Meridian 1 or Succession CSE 1000 protocol supports 64 kbps clear transmission.

Channel parameters

There are two types of ISDN channels B-channels and D-channels.

B-channels

To minimize glare situations, Meridian 1 or Succession CSE 1000 allocates B-channels from channel 23 down to channel 1; DMS-100 begins at channel 1 and goes up to channel 23.

Set outgoing trunk hunting on B-channels for the round robin searching method, rather than the linear method. Thus, when the system looks for an outgoing idle trunk, it looks for the next lower available trunk member, rather than the last member that was used.

The B-channel network loop, 0–511, and the PRI channel number, 1–23, are defined in LD 14.

D-channels

The D-channel location must be coordinated with the far end. See the correlation tables in this guide for specific information.

To establish the PRI link, the D-channel interface port number and PRI loop numbers are associated in LD 17. The DCHI port number must be an odd number between 1 and 15. PRI loop numbers may be between 0 and 511.

The D-channel can operate at 56 or 64 kbps data rate. It can be 64 kbps clear, 64 kbps restricted (inverted HDLC), or 56 kbps. The selection of data rate is on a per PRI basis and is determined by service change. The B8ZS zero code suppression method is used to achieve 64 kbps clear channel for the D-channel.

For incoming PRI messages, the printout of the D-channel monitor message differs from the actual message received by the Meridian 1 or Succession CSE 1000. This is due to the fact that layer 2 preprocesses the message before sending it to layer 3. Outgoing PRI messages appear exactly as sent.

Interface protocols

User-to-network

The interface protocol between Meridian 1 or Succession CSE 1000 and central office (CO) PRI equipment is a user-to-network protocol. If the far end is identified as a CO in service change (LD 17), the Meridian 1 or Succession CSE 1000 system is automatically designated as the “user.”

The user-to-network protocol does not employ the same call states and state transactions at each end, and does not always send the same response to a given protocol message. In addition, the user-to-network protocol has an implicit master-slave relationship, relinquishing control to the network in cases such as glare resolution.

Symmetric

The interface protocol between a Meridian 1 or Succession CSE 1000 and another Meridian 1 or Succession CSE 1000 is a symmetric protocol. Call processing uses a master-slave relationship for glare resolution.

One PBX must be designated as the network (master), the other as the user (slave) (in LD 17). If the master side of the interface sends a SETUP message as the slave initiates an outgoing call, priority is given to the call sent from the master switch. The outgoing call on that channel, the call initiated by the slave, is dropped and another virtual B-channel is selected for call origination.

Meridian 1 Correlation tables

Contents

The following are the topics in this section:

Meridian 1-to-Meridian 1 correlation tables over 2.0 Mb PRI 45
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Meridian 1-to-Meridian 1 correlation tables 48
Meridian 1-to-DMS-100 correlation tables 49
Meridian 1-to-DMS-250 correlation tables 49

Meridian 1-to-Meridian 1 correlation tables over 2.0 Mb PRI

The correlation tables that follow are used to coordinate the software features between two Meridian 1 switches over 2.0 Mb ISDN PRI.

These tables describe how to coordinate the software features between two Meridian 1 switches. The first set of tables indicates which prompts in which overlays are to be given the same responses on each Meridian 1. (The possible responses to these prompts are discussed elsewhere in this NTP.) The second table shows the prompt which requires a different response at each Meridian 1, and provides the response to be entered.

Table 5
PRI database correlation (protocol layer 1) — Overlay Prompts to be Matched (Part 1 of 2)

Overlay	Prompts/Commands	Description
17	PRI2	Digital connection type, on a loop basis
60	DISY L	Inhibit alarm transmission

Table 5
PRI database correlation (protocol layer 1) — Overlay Prompts to be Matched (Part 2 of 2)

73	BIPV	Bit error rate maintenance threshold Bit error rate out-of-service threshold
	BIPC	Bit error rate 24-hour threshold
	FAP	Frame alignment maintenance threshold Frame alignment out-of-service threshold

Table 6
DCH database correlation (protocol layer 2) — Overlay Prompts to be Matched

Overlay	Prompts/Commands	Description
17	DCHI DCHL	Associate D-channel with PRI2
	USR	DCHI mode
	RCVP	D-channel recovery

Table 7
Facility database correlation (protocol layer 3) — Overlay Prompts to be Matched

Overlay	Prompts/Commands	Description
16	SRCH	B-channel selection
	MODE	DCHI mode route
14	TN	B-channels defined
17	IFC	Interface type

Table 8
Database correlation — Prompt requiring different responses at each Meridian 1

Description	Meridian 1	Meridian 1
USER-USER INTERFACE	Overlay:17 Prompt:SIDE Response:MAS	Overlay:17 Prompt:SIDE Response:SLAV

Meridian 1-to-Meridian 1 correlation tables over 1.5 Mb PRI

The correlation tables that follow are used to coordinate the software features between two switches, over 1.5 Mb ISDN PRI.

The following correlation tables are contained in this module:

- Meridian 1 switch to another Meridian 1 switch
- Meridian 1 switch to DMS-100 switch
- Meridian 1 switch to DMS-250 switch

Note 1: The Meridian 1 to SL-100 datafill is the same as the Meridian 1 to DMS-100 datafill.

Note 2: Due to proprietary constraints, the Meridian 1 to AT&T 4ESS and AT&T 5ESS datafill is not available for publication in this document.

The following tables are provided for Meridian 1 to Meridian 1:

— Table 9 PRI database correlation (protocol layer 1)
— Table 10 DCH database correlation (protocol layer 2)
— Table 11 Facility database correlation (protocol layer 3)

The following tables are provided for Meridian 1 to DMS-100:

— Table 12 PRI database correlation (protocol layer 1)
— Table 13 DCH database correlation (protocol layer 2)
— Table 14 Facility database correlation (protocol layer 3)

The following tables are provided for Meridian 1 to DMS-250:

— Table 15 PRI database correlation (protocol layer 1)
— Table 16 DCH database correlation (protocol layer 2)
— Table 17 Facility database correlation (protocol layer 3)

Meridian 1-to-Meridian 1 correlation tables

Table 9 through Table 10 describe how to coordinate the software features between two Meridian 1 switches. The tables consist of three columns. The description column lists the software feature to be coordinated. The first Meridian 1 column lists the Meridian 1 software prompts and the proper responses for a corresponding feature. The second Meridian 1 column lists the software tables and the correct values for the fields in these tables. The Meridian 1 system information also corresponds to a particular feature.

Each of the tables corresponds to one of three protocol layers.

> ***Note:*** Both the near and the far ends must match the parameters. For example, DLOP, LCMT, and YALM responses must be the same for both ends. This applies to all the following tables for Meridian 1 to Meridian 1 configuration.

Meridian 1-to-DMS-100 correlation tables

Table 12 through Table 14 describe how to coordinate the software features between a Meridian 1 switch and a DMS-100 switch. The tables consist of three columns. The description column lists the software feature to be coordinated. The Meridian 1 column lists the Meridian 1 software prompts and the proper responses for a corresponding feature. The DMS-100 column lists the software tables and the correct values for the fields in these tables. The DMS-100 information also corresponds to a particular feature.

Each of the tables corresponds to one of three protocol layers.

Meridian 1-to-DMS-250 correlation tables

Table 15 through Table 17 describe how to coordinate the software features between a Meridian 1 switch and a DMS-250 switch. The tables consist of three columns. The description column lists the software feature to be coordinated. The Meridian 1 column lists the Meridian 1 software prompts and the proper responses for a corresponding feature. The DMS-250 column lists the software tables and the correct values for the fields in these tables. The DMS-250 information also corresponds to a particular feature.

Table 9
PRI database correlation (protocol layer 1) for Meridian 1 to Meridian 1 (Part 1 of 2)

Description	Meridian 1		Meridian 1	
CARD TYPE	Program: Prompt: Response:	LD 17 MODE PRI	Program: Prompt: Response:	LD 17 MODE PRI
FRAME FORMAT Superframe Extended Superframe (ESF)	Program: Prompt: Response:	LD 17 DLOP (field ff) D3 ESF	Program: Prompt: Response:	LD 17 DLOP (field ff) D3 ESF
LINE ENCODING Zero code suppression Bit 8 zero suppression	Program: Prompt: Response:	LD 17 LCMT AMI B8S	Program: Prompt: Response:	LD 17 LCMT AMI B8S
BIT ERROR RATE BASE Bipolar violations CRC	Program: Prompt:	LD 73 n/a (preset to four classes of error rates)	Program: Prompt:	LD 73 n/a (preset)

Table 9
PRI database correlation (protocol layer 1) for Meridian 1 to Meridian 1 (Part 2 of 2)

Description	Meridian 1		Meridian 1	
DATA LINK (yellow alarm method)	Program: Prompt: Response:	LD 17 YALM DG2 FDL	Program: Prompt: Response:	LD 17 YALM DG2 FDL
INHIBIT ALARM TRANSMISSION	Program: Prompt:	LD 60 DISY L (disable yellow alarm for loop L)	Program: Prompt:	LD 60 DISY L (disable yellow alarm for loop L)
BIT ERROR RATE maintenance threshold	Program: Prompt: Response:	LD 73 BIPV 1–(3)–4	Program: Prompt: Response:	LD 73 BIPV 1–(3)–4
BIT ERROR RATE out of service threshold	Program: Prompt: Response:	LD 73 BIPC 1–(2)–4	Program: Prompt: Response:	LD 73 BIPV 1–(2)–4
BIT ERROR RATE 24-hour threshold (errored second threshold)	Program: Prompt: Response:	LD 73 BIP 0–(3)–128	Program: Prompt: Response:	LD 73 BIPC 0–(3)–128
FRAME ALIGNMENT maintenance threshold	Program: Prompt: Response:	LD 73 LFAL 1–(17)–10240	Program: Prompt: Response:	LD 73 LFAL 1–(17)–10240
FRAME ALIGNMENT out of service threshold	Program: Prompt: Response:	LD 73 LFAL 1–(511)–10240	Program: Prompt: Response:	LD 73 LFAL 1–(511)–10240
FRAME SLIP maintenance threshold	Program: Prompt: Response:	LD 73 SRNT 1–(15)–1024	Program: Prompt: Response:	LD 73 SRNT 1–(15)–1024
FRAME SLIP out of service threshold	Program: Prompt: Response:	LD 73 SRNT 1–(3)–1024	Program: Prompt: Response:	LD 73 SRNT 1–(3)–1024

Table 10
DCH database correlation (protocol layer 2) for Meridian 1 to Meridian 1

Description	Meridian 1		Meridian 1	
Associate D-channel with PRI	Program: Prompt and ADAN DCHL	LD 17 Response: DCH xx PRI loop	Program: Prompt and ADAN DCHL	LD 17 Response: DCH xx PRI loop
Associate backup D-channel with PRI	Program: Prompt and ADAN BCHL RCVP	LD 17 Response: BDCH x is the backup D-channel number xx is the associated PRI card (or PRI loop) Yes requests recovery to the primary D-channel	Program: Prompt and ADAN BCHL RCVP	LD 17 Response: BDCH x is the backup D-channel number xx is the associated PRI card (or PRI loop) Yes requests recovery to the primary D-channel
Data rate of D-channel	Program: Prompt and DRAT	LD 17 Response: 64KC, 56KI	Program: Prompt and DRAT	LD 17 Response: 64KC, 56KI
DCH mode	Program: Prompt and USR	LD 17 Response: PRI, SHA, ISLD	Program: Prompt and USR	LD 17 Response: PRI, SHA, ISLD

Table 11
Facility database correlation (protocol layer 3) for Meridian 1 to Meridian 1

Description	Meridian 1		Meridian 1	
B-channel selection	Program: Prompt: Response:	LD 16 SRCH RRB	Program: Prompt: Response:	LD 16 SRCH RRB
Loss and level		preset		preset
User-user interface	Program: Prompt: Response:	LD 17 SIDE NET	Program: Prompt: Response:	LD 17 SIDE USR
B-channels defined	Program: Prompt: Response:	LD 14 TN network loop and channel	Program: Prompt: Response:	LD 14 TN network loop and channel
Interface type	Program: Prompt: Response:	LD 17 IFC SL1	Program: Prompt: Response:	LD 17 IFC SL1
DCH mode route	Program: Prompt: Response:	LD 16 MODE PRI, ISLD	Program: Prompt: Response:	LD 16 MODE PRI, ISLD

Table 12
PRI database correlation (protocol layer 1) for Meridian 1 to DMS-100 (Part 1 of 2)

Description	Meridian 1		DMS-100	
Card type	Program: Prompt: Response:	LD 17 MODE PRI	Table: Field: Value:	CARRMTC CARD NT6X50AA NT6X50AB
Frame format Superframe Extended Superframe	Program: Prompt: Response:	LD 17 DLOP (field ff) D3 ESF	Table: Field: Value:	CARRMTC FF SF ESF
Line encoding Zero code suppression Bit 8 zero suppression	Program: Prompt: Response:	LD 17 LCMT AMI B8S	Table: Field: Value:	CARRMTC ZLG ZCS B8ZS
Bit error rate base Bipolar violations CRC	Program: Prompt:	LD 73 n/a (preset to four classes of error rates)	Table: Field: Value:	CARRMTC BERB BPV CRC
Data link (yellow alarm method) No data link	Program: Prompt: Response:	LD 17 YALM DG2 (Note) FDL	Table: Field: Value:	CARRMTC DLK NILDL
Note: When the DMS-100 CARRMTC table has Field = FF and Value = SF, configure the Meridian 1 with DG2. When the DMS-100 CARRMTC table has Field = FF and Value = ESF, configure the Meridian 1 with FDL.				
Inhibit alarm transmission	Program: Prompt:	LD 60 DISY L (disable yellow alarm for loop L)	Table: Field: Value:	CARRMTC IAT Y N
Bit error rate maintenance threshold	Program: Prompt: Response:	LD 73 BIPV 1–(3)–4	Table: Field: Value:	CARRMTC BERML 6
Bit error rate out of service threshold	Program: Prompt: Response:	LD 73 BIPV 1–(2)–4	Table: Field: Value:	CARRMTC BEROL 3 (exponent)

Table 12
PRI database correlation (protocol layer 1) for Meridian 1 to DMS-100 (Part 2 of 2)

Description	Meridian 1		DMS-100	
Bit error rate 24-hour threshold (errored second threshold)	Program: Prompt: Response:	LD 73 BIPC 0–(3)–128	Table: Field: Value:	CARRMTC ES 864
Frame alignment maintenance threshold	Program: Prompt: Response:	LD 73 LFAL 1–(17)–10240	Table: Field:	CARRMTC FRAMEML
Frame alignment out of service threshold	Program: Prompt: Response:	LD 73 LFAL 1–(511)–10240	Table: Field: Value:	CARRMTC FRAMEOL 511 (exponent)
Frame slip maintenance threshold	Program: Prompt: Response:	LD 73 SRNT 1–(15)–1024	Table: Field: Value:	CARRMTC SLIPML 4
Frame slip out of service threshold	Program: Prompt: Response:	LD 73 SRNT 1–(3)–1024	Table: Field: Value:	CARRMTC SLIPOL 255 (exponent)

Table 13
DCH database correlation (protocol layer 2) for Meridian 1 to DMS-100

Description	Meridian 1		DMS-100	
Associate D-channel with PRI	Program: Prompt and Response: ADAN DCHL	LD 17 DCH xx PRI loop	Table: Field: Value:	TRKSGRP DCHNL same as DS1 end point in table SPECCONN
Associate backup D-channel with PRI	Program: Prompt and Response: ADAN BCHL RCVP	LD 17 BDCH x is the backup D-channel number xx is the associated PRI card (or PRI loop) Yes requests recovery to the primary D-channel	Table: Field: Value:	TRKGRP DCHBCKUP Same as DS1 end point in table SPECCONN
Data rate of D-channel	Program: Prompt and Response: DRAT	LD 17 64KC, 56KI	Table: Field: Value: Field: Value:	STINV CONTYPE PRIBAUD BAUD 64 kbps 56 kbps

Table 14
Facility database correlation (protocol layer 3) for Meridian 1 to DMS-100

Description	Meridian 1		DMS-100	
Q.931 Interface identifier (used in CID IE)	n/a		Table: Field: Value:	IACPSINV IID 0
Q.931 Call Reference Value Length	n/a		Table: Field: Value:	TRKSGRP CRLENGTH 2
B-channel selection	Program: Prompt: Response:	LD 16 SRCH RRB LIN	Table: Value: Field:	TRKGRP SELSEQ MIDL ASEQ
Billing at Primary Rate Interface (PRI)	n/a		Table: Field: Value:	TRKGRP BILLDN N
loss and level	preset		Table: Field: Value:	TRKGRP PADGRP PRAC
User-network interface	Program: Prompt: Response:	LD 17 IFC D100 (sets user)	Table: Field: Value:	TRKSGRP IFCLASS NETWORK
Q.931 progress indicator location	n/a		Table: Field: Value:	TRKSGRP LOCATION USER
B-channels defined	Program: Prompt: Response:	LD 14 TN 0–159 = network loop 1–23 = channel	Table: Field: Value:	TRKMEM EXTTRKMEM IACCKTTS

Each of the tables corresponds to one of three protocol layers.

Table 15
PRI database correlation (protocol layer 1) for Meridian 1 to DMS-250 (Part 1 of 2)

Description	Meridian 1		DMS-250	
Card type	Program: Prompt: Response:	LD 17 MODE PRI	Table: Field: Value:	CARRMTC CARD NT6X50AA NT6X50AB
Frame format Superframe Extended Superframe	Program: Prompt: Response:	LD 17 DLOP D3 ESF	Table: Field: Value:	CARRMTC FF SF ESF
Line encoding Zero code suppression Bit 8 zero suppression	Program: Prompt: Response:	LD 17 LCMT AMI B8S	Table: Field: Value:	CARRMTC ZLG ZCS B8ZS
Bit error rate base Bipolar violations CRC	Program: Prompt:	LD 73 n/a (preset to four classes of error rates)	Table: Field: Value:	CARRMTC BERB BPV CRC
Data link (yellow alarm method) No data link	Program: Prompt: Response:	LD 17 YALM n/a DG2 FDL	Table: Field: Value:	CARRMTC DLK NILDL FDL1 FDL2
Inhibit alarm transmission	Program: Prompt:	LD 60 DISL/X (disable yellow alarm for loop L)	Table: Field: Value:	CARRMTC IAT YN
Bit error rate maintenance threshold	Program: Prompt: Response:	LD 73 BIPV 1–(3)–4	Table: Field: Value:	CARRMTC BERML 6

Table 15
PRI database correlation (protocol layer 1) for Meridian 1 to DMS-250 (Part 2 of 2)

Description	Meridian 1		DMS-250	
Bit error rate out of service threshold	Program: Prompt: Response:	LD 73 BIPV 1–(2)–4	Table: Field: Value:	CARRMTC BEROL 3 (exponent)
Bit error rate 24-hour threshold (errored second threshold)	Program: Prompt: Response:	LD 73 BIPC 0–(3)–128	Table: Field: Value:	CARRMTC ES 864
Frame alignment maintenance threshold	Program: Prompt: Response:	LD 73 LFAL 1–(17)–10240	Table: Field: Value:	CARRMTC FRAMEML 17
Frame alignment out of service threshold	Program: Prompt: Response:	LD 73 LFAL 1–(511)–10240	Table: Field: Value:	CARRMTC FRAMEOL 511 (exponent)
Frame slip maintenance threshold	Program: Prompt: Response:	LD 73 SRNT 1–(15)–1024	Table: Field: Value:	CARRMTC SLIPML 4
Frame slip out of service threshold	Program: Prompt: Response:	LD 73 SRNT 1–(3)–1024	Table: Field: Value:	CARRMTC SLIPOL 255 (exponent)

Table 16
DCH database correlation (protocol layer 2) for Meridian 1 to DMS-250

Description	Meridian 1		DMS-250	
Associated D-channel with PRI	Program:	LD 17	Table:	TRKSGRP
	Prompt and Response:		Field:	PMTYPE
	ADAN	DCH xx	Value:	DTCI
	DCHL	PRI loop	Field:	DTCINO
			Value:	Nil
			Field:	DTCICKTNO
			Value:	16
			Field:	DTCICKTTS
			Value:	24
Data rate of D-channel	Program:	LD 17	Table:	TRKSGRP
	Prompt and Response:		Field:	DCHRATE
	DRAT	64KC, 56KI	Value:	56 kbps
			Value:	64 kbps

Table 17
Facility database correlation (protocol layer 3) for Meridian 1 to DMS-250

Description	Meridian 1		DMS-250	
Q.931 Interface identifier (used in CID IE)	n/a		Table: Field: Value:	LTCTSINV PSLNKTAB O/DSIPRA/ Default/N/Nil
Q.931 Call Reference Value Length	n/a		Table: Field: Value:	TRKSGRP CRLENGTH 2
B-channel selection	Program: Prompt: Response:	LD 16 SRCH RRB/LIN	Table: Value: Field:	TRKGRP SELSEQ MIDLASEQ
Billing at PRI interface	n/a		Table: Field: Value:	TRKGRP BILLDN N
Loss and level	preset		Table: Field: Value:	TRKGRP PADGRP PRAC
User-network interface	Program: Prompt: Response:	LD 17 IFC D250 (sets user)	Table: Field: Value:	TRKSGRP IFCLASS NETWORK
Q.931 progress indicator location	n/a		Table: Field: Value:	TRKSGRP LOCATION USER
Backup D-channels defined	Program: Prompt: Response:	LD 14 TN 0–159 = network loop 1–23 = channel	Table: Field: Value: Field: Value: Field: Value: Field: Value:	TRKMEM PMTYPE DTCI DTCINO Nil DTCICKTNO 16 DTCICKTTS 5

Data administration

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PRI implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 73 - Set error detection thresholds and clock synchronization control. This configuration is required only when configuring PRI for the first time, and is optional for subsequent configurations.

2 LD 73 - Change existing thresholds, or change tracking modes.

3 LD 17 - Configure a PRI interface on the Meridian 1 PBX.

4 LD 17 - Configure the Primary D-channel.

5 LD 17 – Configure a Back-up D-channel. This step is optional, and performed only if a Back-up D-Channel is required.

6 LD 17 – Configure nB+D on the Meridian 1. This step is optional, and requires the International nB+D (INBD) package 255 to be equipped and enabled on the Meridian 1.

7 LD 73 – Define the digital pad tables, per country requirement.

8 LD 16 – Configure a PRI route.

9 LD 14 – Configure PRI trunks.

LD 73 - Set error detection thresholds and clock synchronization control. This configuration is required only when configuring PRI for the first time, and is optional for subsequent configurations.

Prompt	Response	Description
REQ	NEW	Create a PRI data block
TYPE	DDB	Digital data block
PREF	xx	Primary reference source for clock controller.
	<cr>	Free run mode No primary or secondary reference source assigned X preceding the number deletes existing primary reference source
SREF	xx	Secondary reference source for clock controller prompted only if PREF is not free run
	<cr>	Free run mode No primary or secondary reference source assigned X preceding the number deletes existing secondary reference source
TRSH	0–99	Create or change a PRI threshold set Enter this number in LD 17 when defining the PRI loop
		X preceding number deletes threshold set
RALM	1–(3)–128	Yellow alarm (remote alarm) 24-hour threshold Number of remote alarm clear signals received in 24 hours
		If the threshold is reached, the PRI must be restored to service manually
BIPC	0–(2)–128	24-hour bit rate violation threshold **If zero is entered, trunks are restored to service automatically**
		With D2, D3, or D4 framing format, bipolar violation threshold With ESF, Cyclic Redundancy Check (CRC) threshold
LFAC	0–(3)–128	24-hour loss of frame alignment threshold **If zero is entered, trunks are restored to service automatically**

Prompt	Response	Description
BIPV		Bit rate (bipolar violation and CRC) monitoring limits
	1–(3)–4	Maintenance threshold
	1–(2)–4	Out-of-service threshold
SRTK		Frame slip tracking monitoring limits
	1–(5)–24	Maintenance threshold, the minimum time, in hours, between slips
	1–(30)–3600	Out-of-service threshold, the maximum number of slips per hour
SRNT		Frame slip free run (nontracking) monitoring limits
	1–(15)–1024	Maintenance threshold, the minimum time, in seconds, between 10 consecutive slips
	1–(3)–1024	Out-of-service threshold, the minimum time, in seconds, between 10 consecutive slips.
LFAL		Loss of frame alignment monitoring limits
	1–(17)–10240 1–(511)–1024 0	Maintenance threshold Out-of-service threshold
SARR	YES–(NO)	Automatic recovery allowed after out-of-service condition
SRIM	(1)-127	Slip Rate Improvement Time, in minutes.
SRMM	1–(2)–127	Slip rate exceeded maintenance limit

LD 73 - Change existing thresholds, or change tracking modes.

Prompt	Response	Description
REQ	CHG	Change a PRI data block
TYPE	DDB	Digital data block
PREF	xx	Primary reference source for clock controller

Prompt	Response	Description
	<cr>	Free run mode No primary or secondary reference source assigned X preceding the number deletes existing primary reference source
SREF	xx	Secondary reference source for clock controller Prompted only if PREF is not free run
	<cr>	Free run mode No primary or secondary reference source assigned X preceding the number deletes existing secondary reference source
TRSH	0–99	Create or change a PRI threshold set Enter this number in LD 17 when defining the PRI loop X preceding number deletes threshold set.
RALM	1–(3)–128	Yellow alarm (remote alarm) 24-hour threshold Number of remote alarm clear signals received in 24 hours If the threshold is reached, the PRI must be restored to service manually
BIPC	0–(2)–128	24-hour bit rate violation threshold If zero is entered, trunks are restored to service automatically With D2, D3, or D4 framing format, bipolar violation threshold With ESF, Cyclic Redundancy Check (CRC) threshold
LFAC	0–(3)–128	24-hour loss of frame alignment threshold If zero is entered, trunks are restored to service automatically
BIPV		Bit rate (bipolar violation and CRC) monitoring limits
	1–(3)–4	Maintenance threshold
	1–(2)–4	Out-of-service threshold
SRTK		Frame slip tracking monitoring limits

Prompt	Response	Description
	1–(5)–24	Maintenance threshold, the minimum time, in hours, between slips
	1–(30)–3600	Out-of-service threshold, the maximum number of slips per hour
SRNT		Frame slip free run (nontracking) monitoring limits
	1–(15)–1024	Maintenance threshold, the minimum time, in seconds, between 10 consecutive slips
	1–(3)–1024	Out-of-service threshold, the minimum time, in seconds, between 10 consecutive slips. See “Coordinating PRI parameters” and *ISDN Primary Rate Interface maintenance* (553-2901-500) for a description of the automatic recovery sequence.
LFAL		Loss of frame alignment monitoring limits
	1–(17)–10240 1–(511)–1024 0	Maintenance threshold Out-of-service threshold
SRIM	(1)–127	Slip Rate Improvement Time in minutes
SRMM	1–(2)–127	Slip Rate Exceeded Maintenance limit

LD 17 - Configure a PRI interface on the Meridian 1 PBX.

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	CEQU	Make changes to Common Equipment parameters.
...		
- PRI	xx	PRI loop number for Options 51C, 61C, 81C. Card number for Option 11C.
...		

LD 17 - Configure the Primary D-channel.

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	ADAN	Action device and number.
- ADAN	NEW DCH xx	Add a D-channel on logical port 0-63, for large systems (51C, 61C, and 81C).
	NEW DCH xx	Add a D-channel on logical port 0-15, for the small system (Option 11C).
- CTYP	MSDL TMDI	Card type where: MSDL = NT6D80 Multi-purpose Serial Data Link, or the NTBK51AA Downloadable D-Channel Daughterboard, for large systems (Options 51C, 61C, or 81C). MSDL = The NTBK51BA Downloadable D-Channel Daughterboard for the small system (Option 11C). TMDI = TMDI (NTRB21) card for Option 11C.
- GRP	0-4	Network group number for Option 81C systems.
- DNUM	0-15	Device number for I/O ports. All ports on the MSDL card share the same DNUM. The MSDL card address settings must match the DNUM value.
- PORT	0-3	Port number on the NT6D80 MSDL card, if the MSDL is used for D-Channel handling on large systems (Options 51C, 61C, 81C).
	0-1	Port number of the NTBK51AA, if the NTBK51AA is used for D-Channel handling on large systems (Options 51C, 61C, 81C). Port 0 of the NTBK51AA can only be defined to work with Loop 0 of the NT5D97AA DDP2 card, and Port 1 of the NTBK51AA can only be defined to work with Loop 1 of the NT5D97AA. This relationship must be reflected in the DCHL prompt, which follows later (either 0 or 1 must be entered when specifying the loop number used by the D-Channel).

	1	Port number of the NTBK51BA, for the small system (Option 11C).
- DES	aaa...a	Designator. DES is used to identify the link and can be up to 16 alphanumeric characters: 0-9, and upper case A-Z. Characters “*” and “#” are not allowed.
- USR	PRI	This D-channel is used for Primary Rate only.
- IFC	xx	Interface type.
- - CNTY	xx	Country of connectivity associated with IFC type.
- - DCHL	0-159	PRI loop number for the D-channel, for large systems (Options 51C, 61C, 81C). If the NTBK51AA is used for D-Channel handling, only loop 0 or 1 can be configured.
	1-9	Card slot number to be used as the primary DDCH/DCHI, for small system (Option 11C).
- PRI		Secondary PRI loops and sequence, for nB+D configuration.
	0-159 (0)-15 1-9 (0)-15	For large systems (Options 51C, 61C, 81C). Card slot number, for small system (Option 11C).
- OTBF	0-(32)-127	Output Request Buffers.
- SIDE	(USR) NET	Meridian 1 is network side.
- RLS	xx	Software release of the far end switch.
- RCAP	aaa	Remote capabilities. Enter <cr> when finished entering values.
- OVLR	(NO) YES	Allow Overlap Receiving.
- OVLS	(NO) YES	Allow Overlap Sending.
- MBGA	(NO) YES	Allow Multilocation Business Group.
- NASA	(NO) YES	Allow Network Attendant Service.

- TIMR	(NO) YES	Change Protocol Timer values.
- LAPD	(NO) YES	Change Link Access Protocol for D-Channel parameters.

LD 17 – Configure a Back-up D-channel. This step is optional, and performed only if a Back-up D-Channel is required.

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	ADAN	Action device and number.
- ADAN	NEW BDCH xx	Add a Back-up D-channel on logical port 0-63, for large systems (51C, 61C, and 81C).
	NEW BDCH xx	Add a D-channel on logical port 0-15, for the small system (Option 11C).
- PDCH	0-63	0-63 = Primary D-Channel associated with the Backup D-Channel (for large systems (51C, 61C, and 81C).
	0-15	0-15 = for the small system (Option 11C).
- CTYP	MSDL TMDI	Card type where: MSDL = NT6D80 Multi-purpose Serial Data Link, or the NTBK51AA Downloadable D-Channel Daughterboard, for large systems (Options 51C, 61C, or 81C). MSDL = The NTBK51BA Downloadable D-Channel Daughterboard for the small system (Option 11C). TMDI = TMDI (NTRB21) card for Option 11C.
- GRP	0-4	Network group number for Option 81C systems.
- DNUM	0-15	Device number for I/O ports. All ports on the MSDL card share the same DNUM. The MSDL card address settings must match the DNUM value.
- PORT	0-3	Port number on the NT6D80 MSDL card, if the MSDL is used for D-Channel handling on large systems (Options 51C, 61C, 81C).

	0-1	Port number of the NTBK51AA, if the NTBK51AA is used for D-Channel handling on large systems (Options 51C, 61C, 81C). Port 0 of the NTBK51AA can only be defined to work with Loop 0 of the NT5D97AA DDP2 card, and Port 1 of the NTBK51AA can only be defined to work with Loop 1 of the NT5D97AA. This relationship must be reflected in the DCHL prompt, which follows later (either 0 or 1 must be entered when specifying the loop number used by the D-Channel).
	1	Port number of the NTBK51BA, for the small system (Option 11C).
- RCVP	YES	Auto-recovery to primary D-Channel.
- BCHL	0-159	PRI/PRI2 loop number for the Back-up D-channel, for large systems (Options 51C, 61C, 81C). If the NTBK51AA is used for D-Channel handling, only loop 0 or 1 can be configured.
	1-9	PRI/PRI2 loop number for D-channel (Option 11C).
...		

LD 17 – Configure nB+D on the Meridian 1. This step is optional, and requires the International nB+D (INBD) package 255 to be equipped and enabled on the Meridian 1.

Prompt	**Response**	**Description**
REQ	CHG	Change existing data.
TYPE	ADAN	Action device and number.
- ADAN	NEW DCH xx	Add a D-channel on logical port 0-63, for large systems (51C, 61C, and 81C).
	NEW DCH xx	Add a D-channel on logical port 0-15, for the small system (Option 11C).

- CTYP	MSDL TMDI	Card type where: MSDL = NT6D80 Multi-purpose Serial Data Link, or the NTBK51AA Downloadable D-Channel Daughterboard, for large systems (Options 51C, 61C, or 81C). MSDL = The NTBK51BA Downloadable D-Channel Daughterboard for the small system (Option 11C). TMDI = TMDI (NTRB21) card for Option 11C.
- GRP	0-4	Network group number for Option 81C systems.
- DNUM	0-15	Device number for I/O ports. All ports on the MSDL card share the same DNUM. The MSDL card address settings must match the DNUM value.
- PORT	0-3	Port number on the NT6D80 MSDL card, if the MSDL is used for D-Channel handling on large systems (Options 51C, 61C, 81C).
	0-1	Port number of the NTBK51AA, if the NTBK51AA is used for D-Channel handling on large systems (Options 51C, 61C, 81C). Port 0 of the NTBK51AA can only be defined to work with Loop 0 of the NT5D97AA DDP2 card, and Port 1 of the NTBK51AA can only be defined to work with Loop 1 of the NT5D97AA. This relationship must be reflected in the DCHL prompt, which follows later (either 0 or 1 must be entered when specifying the loop number used by the D-Channel).
	1	Port number of the NTBK51BA, for the small system (Option 11C).
- DES	aaa...a	Designator. DES is used to identify the link and can be up to 16 alphanumeric characters: 0-9, and upper case A-Z. Characters “*” and “#” are not allowed.
- USR	PRI	This D-channel is used for Primary Rate only.
- IFC	xx	Interface type that supports nB+D.
- - CNTY	xx	Country of connectivity associated with IFC type.

- - DCHL	LOOP ID 0-159 (0)-15	Primary PRI loop number and interface identifier, for the D-channel. When INBD package 255 is enabled values for both the PRI loop number (LOOP) and the D-channel interface identifier (ID) must be entered. For large systems (Options 51C, 61C, 81C).
	LOOP ID 1-9 (0)-15	Digital card number and interface identifier for the D-channel, for the small system (Option 11C). When INBD package 255 is enabled values for both the PRI loop number (LOOP) and the D-channel interface identifier (ID) must be entered.
- PRI	0-159 1-126 (LOOP) (ID)	Secondary PRI loop number and interface identifier, for nB+D (prompted if INBD package 255 is enabled). The values entered must be different than those entered for the loop number and interface identifier at the DCHL prompt. For large systems (Options 51C, 61C, 81C). The PRI prompt is generated until <CR> is entered.
	LOOP ID 1-9 (0)-15	Secondary digital card number and interface identifier (prompted if INBD package 255 is enabled). The values entered must be different than those entered for the card number and interface identifier at the DCHL prompt. For the small system (Option 11C).
PRI	<CR>	End configuration.
...		

LD 73 – Define the digital pad tables, per country requirement.

Prompt	**Response**	**Description**
REQ	NEW CHG OUT END PRT	NEW = Add new data. CHG = Change existing data. OUT = Remove existing data. END = Exit LD 73. PRT = Print specified data.
TYPE	PRI	Primary Rate Interface.

FEAT	PAD	Feature is digital pad.
PDCA	(1)-16	Pad category table number.
TNLS	YES NO	Print TN list (if REQ = PRT).
DFLT	(1)-16	Default table (when REQ = NEW).
The following prompts define the pad levels. The receiving pad code is *r* and the transmission pad code is *t*. These entries have the range 0-15. The pad values (in decibels) relating to these codes are shown after this table.		
ONP	r t	On-premises extension.
DSET	r t	Meridian Digital set (prompted only if the 1.5/2.0 Mbps Gateway feature is available and equipped).
OPX	r t	Off-premises extension.
DTT	r t	Digital TIE trunks.
NTC	r t	Non-transmission compensated.
TRC	r t	Transmission compensated.
DTR		
DCO	x y	digital COT, FEX, WAT, and DID trunks.
VNL	r t	VIA NET LOSS.
ACO	r t	Analog CO or WATS trunks.
AFX	r t	Analog FEX trunks.
ADD	r t	Analog DID trunks.
PRI	r t	1.5 Mbps PRI/DTI trunk (prompted only if the 1.5/2.0 Mbps Gateway feature is available and equipped and TYPE=PRI2).

PRI2	r t	2.0 Mbps PRI/DTI trunk (prompted only if the 1.5/2.0 Mbps Gateway feature is available and equipped and TYPE=PRI).
XUT	r t	Analog CO trunk
XEM	r t	Analog TIE trunk

LD 16 – Configure a PRI route.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	RDB	Route Data Block.
CUST	xx	Customer number, as already defined in LD 15. xx = 0-99 for large systems (Options 51C, 61C, 81C). xx = 0-31 for the small system (Option 11C).
ROUT	xxx	Route number. xxx = 0-511 for large systems (Options 51C, 61C, 81C). xxx = 0-127 for the small system (Option 11C).
DES	PRI	Designator field for trunk.
TKTP	TIE	TIE trunk type (this is the only type allowed).
...		
DTRK	YES	Digital trunk route.
- DGTP	PRI	PRI digital trunk.
ISDN	YES	Integrated Services Digital Network.
- MODE	PRA	ISDN PRI route.
- IFC	xx	Interface type.
- - CNTY	xx	Country of connectivity associated with IFC type.
- - PNI	(0)-32700	Private Network identifier.

- NCNA	YES	Network Calling Name allowed.
- NCRD	YES	Network Call Redirection allowed.
...		
ICOG	IAO	Incoming and Outgoing trunks.
SRCH	(LIN) RRB	Search method for outgoing trunk member. LIN = Linear Hunt search method. RRB = Round Robin search method.
...		
ACOD	xxx..x	One-seven-digit access code for the trunk route.
TARG	0-(1)-31	Trunk Access Restriction Group Number.
SIGO	aaaa	Signaling Arrangement. aaaa = (STD), ESN2, ESN3, ESN5, ETN, EN19.
...		
DTRK	(NO) YES	Digital trunk route. YES=digital, NO=analog.
DGTP	PRI2	Select a digital trunk type of 2.048 Mb/s PRI.
ISDN	(NO) YES	ISDN option.
MODE	PRA ISL	ISA route for ISDN PRA. ISA route for ISL application. There is no default.
PNI	1-32700	Customer private identifier—unique to a customer. Within one network, use the same value for PNI in both the Customer Data Block (LD 15) and the Route Data Block (LD 16). When interworking with different networks, the Customer Data Block PNI is the PNI of your switch. The Route Data Block PNI is the PNI of the target (remote) switch.

CTYP	DCHI MSDL	The card type on which the I/O device is to be configured. There is no default. You must choose one of the available responses.
PTYP		Port type at far end: **Analog TIE trunk routes:**
	(ATT) AST	Analog TIE trunk Analog satellite Meridian 1 TIE trunk or ESN satellite Meridian 1 TIE trunk
	AOT	Analog TIE trunk, used instead of ATT whenever the Meridian 1 has one or more digital satellite trunk routes (DST) to any digital satellite Meridian 1 which includes OPX sets
		Digital TIE trunk routes:
	(DTT) DCT DST	Digital TIE trunk Combination digital TIE trunk Digital satellite Meridan 1 TIE trunk
AUTO	(NO) YES	Auto-terminate must be NO if response to DSEL is VOD
ICOG	IAO ICT OGT	Incoming and outgoing trunk Incoming trunk Outgoing trunk
SRCH	(LIN) RRB	Linear search. round-robin search—use for outgoing trunks.
ACOD	xxxx	Trunk route access code.
TARG	1-15	Trunk access restriction group for routes.
OABS	0-9	Outgoing digit(s) to be absorbed.
INST	(0)-999	Digits to be inserted.
CNTL	(NO)YES	Changes to controls or timers.

LD 14 – Configure PRI trunks.

Prompt	**Response**	**Description**
REQ	NEW CHG	Add new data. Change existing data.

TYPE	TIE	TIE trunk data block.
TN	l ch	Loop and channel for digital trunks, where: l = Previously defined PRI loops. ch = channel 1-30.
		For large systems (Options 51C, 61C, 81C).
	c u	c = card. u = unit.
		For the small system (Option 11C).
DES	PRI	Designator field for trunk.
PDCA	(1)-16	Pad category table number.
PCML		Pulse Code Modulation Law. Enter the appropriate value, based on which companding law is being used on the Meridian 1.
	A MU	A = A-Law. MU = u-Law.
CUST	xx	Customer number, as already defined in LD 15. xx = 0-99 for large systems (Options 51C, 61C, 81C). xx = 0-31 for the small system (Option 11C).
NCOS	(0)-99	Network Class of Service group.
RTMB	0-511 1-510 0-127 1-510	Route number and member number. For Option 11C.
MNDN	xxx..x	One-seven digit manual Directory Number.
TGAR	0 - (1) - 31	Trunk Group Access Restriction. The default of 1 automatically blocks direct access.
CLS	aaaa	Class of Service.
...		

DTI implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 17 – Configure a DTI interface on the Meridian 1 PBX.

2 LD 16 – Configure a DTI route.

3 LD 14 – Configure DTI trunks.

4 LD 73 – Define the digital pad tables, per country requirement.

5 LD 73 – Configure an ABCD (signaling category table). ABCD tables apply only to DTI/DTI2 interfaces. This step is optional.

LD 17 – Configure a DTI interface on the Meridian 1 PBX.

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	CEQU	Make changes to Common Equipment parameters.
...		
- DTI	xx	DTI loop number for Options 51C, 61C, 81C. Card number for Option 11C.
...		

LD 16 – Configure a DTI route.

Prompt	Response	Description
REQ	NEW	Add new data.
TYPE	RDB	Route Data Block.
CUST	xx	Customer number, as already defined in LD 15.
ROUT	xxx	Route number. xxx = 0-511 for large systems (Options 51C, 61C, 81C). xxx = 0-127 for the small system (Option 11C).

DES	DTI	Designator field for trunk.
TKTP	TIE	TIE trunk type (this is the only type allowed).
...		
DTRK	YES	Digital trunk route.
- DGTP	DTI/DTI2	Digital trunk.
ISDN	YES	Integrated Services Digital Network.
...		
ICOG	IAO	Incoming and Outgoing trunks.
SRCH		Search method for outgoing trunk member.
	(LIN) RRB	Linear Hunt search method. Round Robin search method.
...		
ACOD	xxx..x	One-seven-digit access code for the trunk route.
TARG	0-(1)-31	Trunk Access Restriction Group Number.
SIGO	aaaa	Signaling Arrangement. aaaa = (STD), ESN2, ESN3, ESN5, ETN, EN19.
...		

LD 14 – Configure DTI trunks.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	TIE	TIE trunk data block.

TN	l ch	Loop and channel for digital trunks, where: l = Previously defined PRI loops. ch = channel 1-30. For large systems (Options 51C, 61C, 81C).
	c u	c = card. u = unit. For the small system (Option 11C).
DES	DTI/DTI2	Designator field for trunk.
PDCA	(1)-16	Pad category table number.
PCML		Pulse Code Modulation Law. Enter the appropriate value, based on which companding law is being used on the Meridian 1.
	A MU	A = A-Law. MU = u-Law.
CUST	xx	Customer number, as already defined in LD 15.
NCOS	(0)-99	Network Class of Service group.
RTMB	0-511 1-510 0-127 1-510	Route number and member number. For Option 11C.
MNDN	xxx..x	One-seven digit manual Directory Number.
TGAR	0 - (1) - 31	Trunk Group Access Restriction. The default of 1 automatically blocks direct access.
CLS	aaaa	Class of Service.
...		

LD 73 – Define the digital pad tables, per country requirement.

Prompt	Response	Description
REQ	NEW CHG OUT END PRT	NEW = Add new data. CHG = Change existing data. OUT = Remove existing data. END = Exit LD 73. PRT = Print specified data.

TYPE	DTI/DTI2	Digital Trunk Interface.
FEAT	PAD	Feature is digital pad.
PDCA	(1)-16	Pad category table number.
TNLS	YES NO	Print TN list (if REQ = PRT).
DFLT	(1)-16	Default table (when REQ = NEW).
For the following prompts, **x = Rx code (receive) and y = Tx code (transmit)**. You may assign receive and transmit dB values to the prompts by entering a code which corresponds to a dB value. ***Note:*** For North America, use the following values.		
ONP	Rx Tx	On Premise Extension.
ONP	Rx Tx	On Premise Extension. Rx = 8 Tx = -4
DSET	Rx Tx	Meridian Digital Set. Rx = 8 Tx = -4
OPX	Rx Tx	Off Premise Extension. Rx = 8 Tx = -4
DTT	Rx Tx	Digital TIE trunks. Rx = 0 Tx = 0
SDTT	Rx Tx	Digital Satellite Tie trunks. Rx = 6 Tx = 0
DCO	Rx Tx	1.5 Mb DTI/PRI Digital COT, FEX, WAT, DID trunks. Rx = 3 Tx = 3
VNL	Rx Tx	Via Net Loss Analog TIE trunk. Rx = 3 Tx = 0

SATT	Rx Tx	Analog Satellite TIE trunk. Rx = 6 Tx = 0
ACO	Rx Tx	Analog CO trunk. Rx = 6 Tx = -3
PRI	Tx Rx	1.5 Mb PRI trunk. Applicable when Port Type at far end is PRI for the route (PTYP prompt = PRI in LD 16). Rx = 0 Tx = 0
PRI2	Tx Rx	2.0 Mb DI/PRI trunk. Rx = 0 Tx = 0
XUT	Rx Tx	Extended Peripheral Equipment Universal trunk. Rx = 6 Tx = -3
XEM	Rx Tx	Extended Peripheral Equipment E&M trunk. Rx = 6 Tx = 0

LD 73 – Configure an ABCD (signaling category table). ABCD tables apply only to DTI/DTI2 interfaces. This step is optional.

Prompt	Response	Comment
REQ	aaa	Request (aaa = CHG, END, NEW, OUT, or PRT).
TYPE	aaa	Type of data block.
FEAT	ABCD	Feature = ABCD.
SICA	2-16	Signaling Category.
TNLS	(NO) YES	Terminal Number List.
DFLT	(1)-16	Default signaling category to be used for Default values.
Prompts for Incoming/Outgoing Calls		

IDLE (S)	abcd	Idle.
IDLE (R)	abcd	Idle.
FALT (S)	abcd	Fault (DTI out-of-service).
FALT (R)	abcd	Fault (DTI out-of-service).
P RRC (S)	abcd	Register Recall.
- TIME	10-(100)-630	Time of RRC (S) in milliseconds.
TIME	(0)-1920	Persistence Time required before signal is accepted.

Prompts for Incoming Calls		
SEZ (R)	abcd	Seize for voice or data calls from a non-SL-1.
E SEZ (R)	abcd	Seize for voice or data calls from a non-SL-1.
- TIME	16-(56)-1000 16-(296)-1000.	
		Minimum and maximum acceptable pulse duration.
SEZD (R)	abcd	Seize for data calls between SL-1s.
- SEZV (R)	abcd	Seize for voice calls.
P CALL (R)	abcd	Signal sent during seize by an incoming CO trunk.
- TIME	1-(2)-15 1-(8)-15	
		Pulse on time, pulse off time.
SEZA (S)	abcd	Seize Acknowledgment.
- TIME	50-80-90	Time delay prior to sending SEZA.
PRCS (S)	abcd	PRCS.
WNKS (S)	abcd	Wink Start.
P WNKS (S)	abcd	Wink Start.
- TIME	10-(220)-630	Time for P WNKS (S).
P DIGT (R)	abcd	Decadic pulses.
NRCV (S)	abcd	Number Received.
P EOSF (S)	abcd	End of Selection Free.
- TIME	(100)-150	Time for EOSF (S).
- P EOSB (S)	abcd	End of Selection Busy.
- - TIME	(100)-150	Time for EOSB (S).

P OPC (R)	abcd	Operator Calling.
- TIME	64-(128)-192	Time of OPCA (R) pulse.
- TIME	16-(96)-1000 16-(160)-1000	Minimum and maximum acceptable pulse duration.
- REPT	(1)-5	Number of OPCA (R) pulses.
CONN (S)	abcd	Connect.
E CON (S)	abcd	Connect.
- TIME	10-(150) 630	Time of pulse length in 10 ms increments.
CONN (R)	abcd	Connect.
P BURS (S)	abcd	Bring Up Receiver for L1 networking.
P BURS (R)	abcd	Bring Up Receiver for L1 networking.
- TIME	64-(128)-192	Time for BURS (R) pulse.
CLRB (S)	abcd	Clear Back.
C CLRB (S)	abcd	Clear Back.
- TIME	10-(600)-2000	Time of pulse length in 10 ms increments.
- P RCT (S)	abcd	Release Control.
- - TIME	100-(150) 300	Time value is stored in 10 ms increments.
- - P RCOD (S)	abcd	Release Control Originating party Disconnect.
- - - TIME	150	Timer value in milliseconds is fixed.
P OPRS (R)	abcd	Operator manual recall.
- TIME	xxxx yyyy	Minimum and maximum time range for OPRS (R).
P NXFR (S)	abcd	Network Transfer.

P ESNW (S)	abcd	ESN Wink.
P CAS (S)	abcd	Centralized Attendant.
CLRF (R)	abcd	Clear Forward.
- SOS	abcd	Special Operator Signal.
P BRLS (S)	abcd	Backward Release.
- TIME	10-(600)-2000	Time of pulse length in 10 ms increments.
P FRLS (R)	abcd	Forward Release.
- TIME	16-(296)-2000	16-(960)-2000 Minimum and maximum acceptable pulse duration.

Prompts for Outgoing Calls		
SEZ (S)	abcd	Seize for voice or data calls to a non-SL-1.
E SEZ (S)	abcd	Seize for voice or data calls to a non-SL-1.
- TIME	10-(150)-630	Time of pulse length in 10 ms increments.
SEZD (S)	abcd	Seize for Data calls.
- SEZV (S)	abcd	Seize for Voice calls.
SEZA (R)	abcd	Seize Acknowledgment.
- TIME	xxx	Delay time for the SEZA signal (xxx = 50, 80, 90, (150), or 800).
WNKS (R)	abcd	Wink Start.
- TIME	20-(140)-500	20-(290)-500
		Minimum and maximum length of WNKS (R) pulse.
P WNKS (R)	abcd	Wink Start.
- TIME	16-(136)-504	16-(288)-504
		Minimum and maximum length of P WNKS (R) pulse.
P EOS (R)	abcd	End of Selection.
- TIME	(64)-320	64-(256)-320
		Length of EOS (R) pulse.
CONN (S)	abcd	Connect.
CONN (R)	abcd	Connect.
E CONN (R)	abcd	Connect.
- TIME	16-(56)-1000	16-(296)-1000
		Time of pulse length in 8 ms increments.

P OPRC (R)	abcd	Operator Recall for special services.
P BURS (S)	abcd	Bring Up Receiver for L1 networking.
P BURS (R)	abcd	Bring Up Receiver for L1 networking.
- TIME	64-(128)-192	Time for BURS (R) pulse.
CLRB (R)	abcd	Clear Back.
C CLRB (R)	abcd	Clear Back.
- TIME	16-(296)-2000	16-(960)-2000 Time of pulse length in 8 ms increments.
- P RCTL (R)	abcd	Release Control.
- - TIME	96-(128)-320	96-(256)-320 Time stored in 8 ms increments.
P NXFR (R)	abcd	Network Transfer.
P ESNW (R)	abcd	ESN Wink.
P CAS (R)	abcd	Centralized Attendant Service.
CLRF (S)	abcd	Clear Forward.
- TIME	(0)-800	Time in milliseconds.
- SOS	abcd	Special Operator Signal.
P FRLS (S)	abcd	Forward Release.
- TIME	10-(600)-2000	Only prompted for pulsed signals.
P BRLS (R)	abcd	Backward Release.
- TIME	16-(296)-2000	16-(960)-2000

		Time of pulse length in 8 ms increments.
C SUPO (S)	abcd	Complex Supervision to Operator Signal used for KD3 signaling. Note that the input for a must be C.

1.5/2.0 Mbps Gateway

Contents

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Reference list

The following are the references in this section:

ISDN PRI: Installation (553-2901-201)

Option 11C 2.0Mb DTI/PRI (553-3011-315)

Feature Description

For digital connectivity, via both Digital Trunk Interface (DTI) and Primary Rate Interface (PRI), North America uses 1.5 Mbps carriers programmed as Pulse Code Modulation Companding u-Law. Internationally, in places like Europe, 2.0 Mbps carriers programmed as Pulse Code Modulation Companding A-Law are used. To interconnect these two types of switches, gateways are used. A gateway switch performs conversion from A-Law to u-Law, and u-Law to A-Law.

The North America 1.5/2.0 Mbps Gateway feature provides support for the 1.5/2.0 Mbps gateway functionality in the North American market, by introducing software and hardware into North America that is already being deployed in International markets. This feature allows a Meridian 1 PBX to act as a gateway between a 1.5 Mbps Meridian 1 or Central Office switch programmed as u-Law, and a 2.0 Mbps Meridian 1 or Central Office switch programmed as A-Law. The Meridian 1 performs the conversion from A-Law to u-Law, and u-Law to A-Law.

> ***Note:*** This feature performs conversion from A-Law to u-Law, and u-Law to A-Law. It does not provide interworking between the T-1 and E-1 protocols. Only those features that are equipped on either side of the gateway will be supported transparently across the gateway.

The 2.0 Mb (E-1) in North America capability allows an added bandwidth capability to current Meridian 1 PBX customers, by introducing software and hardware into North America that is already being deployed in International markets. The Bearer channel (B-Channel) capability for PRI voice and data is increased from 23 to 30, and the A/B channels for DTI voice and data is increased from 24 to 30. For an nB+D configuration (nB+D is only supported in an MCDN environment, and not supported by QSIG), the B-Channel capability is 480.

The 2.0 Mb (E-1) in North America capability only applies to “closed campus” environments, supporting only Meridian 1 to Meridian 1 connectivity over the following interface types:

- SL1 (MCDN)
- ETSI (European Telecommunications Standard Institute)

- ETSI QSIG (European Telecommunications Standard Institute QSIG)
- ISIG QSIG (International Standards Organization QSIG)

Back-up D-Channel and nB+D are only supported in an MCDN environment (IFC type of SL1).

The North America 1.5/2.0 Mbps Gateway feature supports the following interfaces:

- SL1
- SL100
- D100
- D250
- ISIG
- ESIG
- ISGF
- ESGF

This feature is supported on large systems (Meridian 1 Options 51C, 61C, and 81C), and on the small system (Meridian 1 Option 11C).

2.0 Mb hardware introduced into North America

To support the North America 1.5/2.0 Mbps Gateway feature, the following existing 2.0 Mbps cards have been introduced in North America.

For PRI2 on Meridian 1 large systems (Options 51C, 61C, 81C):

- NT5D97AA Dual-port DTI2/PRI2 card (in PRI2 mode)
- NTBK51AA Downloadable D-Channel Daughterboard

Note: Please note the vintage requirement of the NTBK51 card. Only one version, the NTBK51AA, can be used with the DDP2 cards. The newer NTBK51BA version has only 30+30 pin connectors (instead of 40+30 pins in the AA version). The missing 10 pins in the BA version prohibits usage of port 0 on the DDP2 card. As shown below, the NTBK51BA is used on the Option 11C, with the NTBK50AA PRI2 card.

For DTI2 on Meridian 1 large systems (Options 51C, 61C, 81C):

- NT5D97AA Dual-port DTI2/PRI2 card (in DTI2 mode)

For PRI2 on the Meridian 1 small system (Option 11C):

- NTBK50AA PRI2 card
- NTBK51BA Downloadable D-Channel Daughterboard, used by the NTBK50AA PRI2 card

For DTI2 on the Meridian 1 small system (Option 11C):

- NTAK10DB DTI2 card

The tables that follow summarize the PRI2 and DTI2 hardware requirements and compatibility.

Note: Please note the following when configuring a Clock Controller. For both large and small systems, either a Stratum 3 or a Stratum 4 Clock Controller is supported, depending on specific country requirements.

Table 18
Large systems (Options 51C, 61C, 81C) PRI2 hardware compatibility

PRI2 card	D-Channel Handling	Clock Controller*
NT5D97AA in PRI2 mode	NT6D80 MSDL	QPC471 card (Stratum 3)
	NT6D11AB/BA/AF external DCHI card	QPC775 card (Stratum 4)
	NTBK51AA Downloadable D-Channel Daughterboard	

* Depending on specific country requirements, either Stratum 3 or Stratum 4 Clocking can be supported.

Table 19
Large systems (Options 51C, 61C, 81C) DTI2 hardware compatibility

DTI2 card	D-Channel Handling	Clock Controller*
NT5D97AA in DTI2 mode	Not Applicable	QPC471 card (Stratum 3)
		QPC775 card (Stratum 4)

* Depending on specific country requirements, either Stratum 3 or Stratum 4 Clocking can be supported.

Table 20
Small system (Option 11C) PRI2 hardware compatibility

PRI2 card	D-Channel Handling	Clock Controller*
NTBK50AA	NTBK51BA downloadable D-Channel Daughterboard NTAK93 D-Channel Handler Interface Daughterboard	NTAK20BD Daughterboard (Stratum 3)

* Depending on specific country requirements, either Stratum 3 or Stratum 4 Clocking can be supported.

Table 21
Small system (Option 11C) DTI2 hardware compatibility

PRI2 card	D-Channel Handling	Clock Controller*
NTAK10DB	Not Applicable	Integrated CC (Stratum 4)

* Depending on specific country requirements, either Stratum 3 or Stratum 4 Clocking can be supported.

Hardware installation

For information on how to install the NT5D97AA Dual-port DTI2/PRI2 card, and the NTBK51AA DDCH card on large systems (Options 51C, 61C, and 81C), please refer to Nortel Networks Publication *ISDN PRI: Installation* (553-2901-201). Also refer to this publication for information on Clocking.

For information on how to install the NTBK50AA PRI2 card, the NTAK10AA DTI2 card, the NTBK51BA DDCH card, and the NTAK20AA Clock Controller on the small system (Option 11C), please refer to *Option 11C 2.0Mb DTI/PRI* (553-3011-315).

2.0 Mb software introduced into North America

To support the North America 1.5/2.0 Mbps Gateway feature, the following existing 2.0 Mb software packages have been introduced in North America.

- 2.0 Mb Digital Trunk Interface (DTI2) package 129
- 2.0 Mb Primary Rate Interface (PRI2) package 154
- International ISDN Supplementary Features (ISDN INTL SUPP) package 161
- International Gateway (GPRI) package 167

- International Primary Rate Access (IPRA) package 202
- International nB+D (INBD) package 255, as an optional package for nB+D applications

Note: The following packages are required as prerequisites:

- Digit Display (DDSP) package 19
- Digital Trunk Interface (DTI) package 75
- Integrated Services Digital Network (ISDN) package 145

Conversion scenarios

Scenario 1 - Gateway u-Law Meridian 1 connected to A-Law Meridian/CO over an A-Law 1.5 Mbps connection

A North America (1.5 Mbps) Meridian 1 PBX, programmed as u-Law, is connected to an International (2.0 Mbps) Meridian 1 PBX, programmed as A-Law. The connection is over an A-Law 1.5 Mbps DTI/PRI link.

In this scenario, the conversion from A-Law to u-Law, and u-Law to A-Law, is done at the Meridian 1 programmed as u-Law. It is this Meridian 1 PBX that acts as the 1.5/2.0 Mbps gateway.

Scenario 2 - Gateway u-Law Meridian 1 connected to A-Law Meridian/CO over an A-Law 2.0 Mbps connection

A North America (1.5 Mbps) Meridian 1 PBX, programmed as u-Law, is connected to an International (2.0 Mbps) Meridian 1 PBX, programmed as A-Law. The connection is over an A-Law 2.0 Mbps DTI/PRI link.

In this scenario, the conversion from A-Law to u-Law, and u-Law to A-Law, is done at the Meridian 1 programmed as u-Law. It is this Meridian 1 PBX that acts as the 1.5/2.0 Mbps gateway.

Scenario 3 - Gateway A-Law Meridian 1 connected to u-Law Meridian/CO over an u-Law 1.5 Mbps connection

An International (2.0 Mbps) Meridian 1 PBX, programmed as A-Law, is connected to a North America (1.5 Mbps) Meridian 1 PBX, programmed as u-Law. The connection is over a u-Law 1.5 Mbps DTI/PRI link.

In this scenario, the conversion from A-Law to u-Law, and u-Law to A-Law, is done at the Meridian 1 programmed as A-Law. It is this Meridian 1 PBX that acts as the 1.5/2.0 Mbps gateway.

Scenario 4 - Gateway A-Law Meridian 1 connected to u-Law Meridian/CO over an u-Law 2.0 Mbps connection

An International (2.0 Mbps) Meridian 1 PBX, programmed as A-Law, is connected to a North America (1.5 Mbps) Meridian 1 PBX, programmed as u-Law. The connection is over a u-Law 2.0 Mbps DTI/PRI link.

In this scenario, the conversion from A-Law to u-Law, and u-Law to A-Law, is done at the Meridian 1 programmed as A-Law. It is this Meridian 1 PBX that acts as the 1.5/2.0 Mbps gateway.

Operating parameters

There are no operating parameters for this feature.

Feature interactions

There are no interactions between this feature and other features.

Note: ISDN networking features will function transparently across the gateway if the dialing plans are consistent on both sides of the gateway.

Feature packaging

This feature is included in base Meridian 1 System Software.

Feature implementation

This section contains procedures on how to configure DTI2 or PRI2 on a Meridian 1, as required for the implementation of the North America 1.5/2.0 Mbps Gateway feature functionality.

Task summary list

The following is a summary of the tasks in this section

1 LD 15 - Configure the Pulse Code Modulation Conversion value on the Meridian 1 PBX.

2 LD 17 - Configure a PRI2 interface on the Meridian 1 PBX.

3 LD 17 - Configure the Pulse Code Modulation Companding Law.

4 LD 17 - Configure the CODEC coding law for the set.

5 LD 97 - Configure the Multifrequency Sender parameters.

6 LD 97 - Configure the system parameters for peripheral equipment.

7 LD 17 - Configure the Primary D-channel.

8 LD 17 – Configure a Back-up D-channel. This step is optional, and performed only if a Back-up D-Channel is required. Please note that Back-up D-Channel is only supported in an MCDN environment (IFC must be set to SL1).

9 LD 17 – Configure nB+D on the Meridian 1. This step is optional, and requires the International nB+D (INBD) package 255 to be equipped and enabled on the Meridian 1. Also, please note that nB+D is only supported in an MCDN environment (IFC must be set to SL1).

10 LD 73 – Define the digital pad tables, per country requirement.

11 LD 16 – Configure a PRI2 route.

12 LD 14 – Configure PRI2 trunks.

13 LD 15 - Configure the Pulse Code Modulation Conversion value on the Meridian 1 PBX.

14 LD 17 – Configure a DTI2 interface on the Meridian 1 PBX.

15 LD 16 – Configure a DTI2 route.

16 LD 14 – Configure DTI2 trunks.

17 LD 73 – Define the digital pad tables, per country requirement.

18 LD 73 – Configure an ABCD (signaling category table). ABCD tables apply only to DTI/DTI2 interfaces. This step is optional.

PRI2 implementation

To configure PRI2 on a Meridian 1 large system or small system PBX, use the following steps:

- Configure the Pulse Code Modulation Conversion value, using LD 15.

- Configure a PRI2 interface, using LD 17.
- Configure a the Pulse Code Modulation Companding Law on the PRI2 D-Channel, using LD 17.

  Please note the following additional steps when using a Meridian M2317 set on a Meridian switch configured as A-Law:

  — Configure the CODEC coding law for the set, using LD 17

  — Configure the Multifrequency Sender parameters, using LD 97

  — Configure the system parameters for peripheral equipment, using LD 97

  — Initialize the Meridian 1 switch, to download all parameters to the line cards. This initialization has to be performed only once.

- Configure a Primary D-Channel for the PRI2 interface, using LD 17.
- Configure a the Pulse Code Modulation Companding Law on the PRI2 D-Channel, using LD 17.
- Configure a Back-up D-Channel, if required, using LD 17.
- Configure nB+D, using LD 17. The International nB+D (INBD) package 255 must be equipped and enabled on the Meridian 1 to configure nB+D.
- Configure a PRI2 pad table, using LD 73.
- Configure a PRI2 route, using LD 16.
- Configure a PR2 trunk, using LD 14.

LD 15 - Configure the Pulse Code Modulation Conversion value on the Meridian 1 PBX.

Prompt	Response	Description
REQ:	CHG	Change existing data.
TYPE:	NET	Make changes to networking data.
CUST	xx	Customer number. xx = 0-99 for large systems (51C, 61C, and 81C). xx = 0-31 for the small system (Option 11C).
...		

ISDN	YES	Integrated Services Digital Network.
...		
- RCNT	0-(5)	Redirection Count for ISDN calls.
- - PCMC	0-(15)-31	The number of Pulse Code Modulation Conversions allowed, from u-Law to A-Law or A-Law to u-Law, in a network connection.
...		

LD 17 - Configure a PRI2 interface on the Meridian 1 PBX.

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	CEQU	Make changes to Common Equipment parameters.
...		
- PRI2	0-159	PRI2 loop number.
...		

LD 17 - Configure the Pulse Code Modulation Companding Law.

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	PARM	Make changes to system parameters.
...		
- PCML		Pulse Code Modulation Law. Enter the appropriate value, based on which companding law is being used on the Meridian 1.
	(MU) A	MU = u-Law. A = A-Law.
...		

Please note the following additional steps when using a Meridian M2317 set on a Meridian switch configured as A-Law:

- Configure the CODEC coding law for the set, using LD 17
- Configure the Multifrequency Sender parameters, using LD 97
- Configure the system parameters for peripheral equipment, using LD 97
- Initialize the Meridian 1 switch, to download all parameters to the line cards. This initialization has to be performed only once.

LD 17 - Configure the CODEC coding law for the set.

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	ATRN	ARIES (M2317) Transmission.
- CODE	2	CODEC coding law.
...		

LD 97 - Configure the Multifrequency Sender parameters.

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	XCTP	Conference/TDS/Multifrequency Sender parameters.
...		
DTMF	138	Dual Tone Multifrequency.
...		

LD 97 - Configure the system parameters for peripheral equipment.

Prompt	Response	Description
REQ	CHG	Change existing data.

TYPE	SYSP	System parameters for peripheral equipment.
INTN	YES	International companding law.
...		
FDLC	P ALL	Fast Download parameters to all line cards.

Initialize the Meridian 1 switch, to download all parameters to the line cards. This initialization has to be performed only once.

For the Meridian 1 programmed as U-Law, use the default values, that is:

- LD 17, when configuring the CODEC coding law, use CODE = 0
- LD 97, when configuring the Multifrequency Sender parameters, use DTMF = 14
- LD 97, when configuring the system parameters for peripheral equipment, use INTN = NO

LD 17 - Configure the Primary D-channel.

Prompt	**Response**	**Description**
REQ	CHG	Change existing data.
TYPE	ADAN	Action device and number.
- ADAN	NEW DCH xx	Add a D-channel on logical port 0-63, for large systems (51C, 61C, and 81C).
	NEW DCH xx	Add a D-channel on logical port 0-15, for the small system (Option 11C).
- CTYP	MSDL	Card type where: MSDL = NT6D80 Multi-purpose Serial Data Link, or the NTBK51AA Downloadable D-Channel Daughterboard, for large systems (Options 51C, 61C, or 81C). MSDL = The NTBK51BA Downloadable D-Channel Daughterboard for the small system (Option 11C).
- GRP	0-4	Network group number for Option 81C systems.

- DNUM	0-15	Device number for I/O ports. All ports on the MSDL card share the same DNUM. The MSDL card address settings must match the DNUM value.
- PORT	0-3	Port number on the NT6D80 MSDL card, if the MSDL is used for D-Channel handling on large systems (Options 51C, 61C, 81C).
	0-1	Port number of the NTBK51AA, if the NTBK51AA is used for D-Channel handling on large systems (Options 51C, 61C, 81C). Port 0 of the NTBK51AA can only be defined to work with Loop 0 of the NT5D97AA DDP2 card, and Port 1 of the NTBK51AA can only be defined to work with Loop 1 of the NT5D97AA. This relationship must be reflected in the DCHL prompt, which follows later (either 0 or 1 must be entered when specifying the loop number used by the D-Channel).
	1	Port number of the NTBK51BA, for the small system (Option 11C).
- DES	aaa...a	Designator. DES is used to identify the link and can be up to 16 alphanumeric characters: 0-9, and upper case A-Z. Characters “*” and “#” are not allowed.
- USR	PRI	This D-channel is used for Primary Rate only.
- IFC		Interface type.
	SL1	MCDN
	SL100	SL100
	D100	DMS-100
	D250	DMS-250
	ETSI	European Telecommunications Standard Institute
	ESIG	ETSI QSIG
	ISIG	International Standards Organization QSIG
- - DCHL	0-159	PRI2 loop number for the D-channel, for large systems (Options 51C, 61C, 81C). If the NTBK51AA is used for D-Channel handling, only loop 0 or 1 can be configured.
	1-9	PRI2 loop number for D-channel, for small system (Option 11C).

- PRI2		Secondary PRI2 loops and sequence, for nB+D configuration.
	0-159 (0)-15 1-9 (0)-15	For large systems (Options 51C, 61C, 81C). For small system (Option 11C). Enter 0, the default.
- OTBF	0-(32)-127	Output Request Buffers. Enter 32, the default.
- SIDE	(USR) NET	Meridian 1 is network side.
- RLS	24	Software release of the far end switch. For a Meridian 1 to Meridian 1 connectivity, both switches must be running Release 24 software.
- RCAP	aaa	Remote capabilities. Enter <cr> when finished entering values.
- OVLR	(NO) YES	Allow Overlap Receiving. Enter NO, the default.
- OVLS	(NO) YES	Allow Overlap Sending. Enter NO, the default.
- MBGA	(NO) YES	Allow Multilocation Business Group. Enter NO, the default.
- NASA	(NO) YES	Allow Network Attendant Service. Enter NO, the default.
- TIMR	(NO) YES	Change Protocol Timer values. Enter NO, the default.
- LAPD	(NO) YES	Change Link Access Protocol for D-Channel parameters. Enter NO, the default.

LD 17 – Configure a Back-up D-channel. This step is optional, and performed only if a Back-up D-Channel is required. Please note that Back-up D-Channel is only supported in an MCDN environment (IFC must be set to SL1).

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	ADAN	Action device and number.
- ADAN	NEW BDCH xx	Add a Back-up D-channel on logical port 0-63, for large systems (51C, 61C, and 81C).
	NEW BDCH xx	Add a D-channel on logical port 0-15, for the small system (Option 11C).
- PDCH	0-63	0-63 = Primary D-Channel associated with the Backup D-Channel (for large systems (51C, 61C, and 81C).
	0-15	0-15 = for the small system (Option 11C).
- CTYP	MSDL	Card type where: MSDL = NT6D80 Multi-purpose Serial Data Link, or the NTBK51AA Downloadable D-Channel Daughterboard, for large systems (Options 51C, 61C, or 81C).
		MSDL = The NTBK51BA Downloadable D-Channel Daughterboard for the small system (Option 11C).
- GRP	0-4	Network group number for Option 81C systems.
- DNUM	0-15	Device number for I/O ports. All ports on the MSDL card share the same DNUM. The MSDL card address settings must match the DNUM value.
- PORT	0-3	Port number on the NT6D80 MSDL card, if the MSDL is used for D-Channel handling on large systems (Options 51C, 61C, 81C).

	0-1	Port number of the NTBK51AA, if the NTBK51AA is used for D-Channel handling on large systems (Options 51C, 61C, 81C). Port 0 of the NTBK51AA can only be defined to work with Loop 0 of the NT5D97AA DDP2 card, and Port 1 of the NTBK51AA can only be defined to work with Loop 1 of the NT5D97AA. This relationship must be reflected in the DCHL prompt, which follows later (either 0 or 1 must be entered when specifying the loop number used by the D-Channel).
	1	Port number of the NTBK51BA, for the small system (Option 11C).
- RCVP	YES	Auto-recovery to primary D-Channel.
- BCHL	0-159	PRI2 loop number for the Back-up D-channel, for large systems (Options 51C, 61C, 81C). If the NTBK51AA is used for D-Channel handling, only loop 0 or 1 can be configured.
	1-9	PRI/PRI2 loop number for D-channel (Option 11C).
...		

LD 17 – Configure nB+D on the Meridian 1. This step is optional, and requires the International nB+D (INBD) package 255 to be equipped and enabled on the Meridian 1. Also, please note that nB+D is only supported in an MCDN environment (IFC must be set to SL1).

Prompt	**Response**	**Description**
REQ	CHG	Change existing data.
TYPE	ADAN	Action device and number.
- ADAN	NEW DCH xx	Add a D-channel on logical port 0-63, for large systems (51C, 61C, and 81C).
	NEW DCH xx	Add a D-channel on logical port 0-15, for the small system (Option 11C).

- CTYP	MSDL	Card type where: MSDL = NT6D80 Multi-purpose Serial Data Link, or the NTBK51AA Downloadable D-Channel Daughterboard, for large systems (Options 51C, 61C, or 81C). MSDL = The NTBK51BA Downloadable D-Channel Daughterboard for the small system (Option 11C).
- GRP	0-4	Network group number for Option 81C systems.
- DNUM	0-15	Device number for I/O ports. All ports on the MSDL card share the same DNUM. The MSDL card address settings must match the DNUM value.
- PORT	0-3	Port number on the NT6D80 MSDL card, if the MSDL is used for D-Channel handling on large systems (Options 51C, 61C, 81C).
	0-1	Port number of the NTBK51AA, if the NTBK51AA is used for D-Channel handling on large systems (Options 51C, 61C, 81C). Port 0 of the NTBK51AA can only be defined to work with Loop 0 of the NT5D97AA DDP2 card, and Port 1 of the NTBK51AA can only be defined to work with Loop 1 of the NT5D97AA. This relationship must be reflected in the DCHL prompt, which follows later (either 0 or 1 must be entered when specifying the loop number used by the D-Channel).
	1	Port number of the NTBK51BA, for the small system (Option 11C).
- DES	aaa...a	Designator. DES is used to identify the link and can be up to 16 alphanumeric characters: 0-9, and upper case A-Z. Characters “*” and “#” are not allowed.
- USR	PRI	This D-channel is used for Primary Rate only.
- IFC	SL1	MCDN interface (nB+D is only supported in an MCDN environment).

- - DCHL	LOOP ID 0-159 (0)-15	Primary PRI2 loop number and interface identifier, for the D-channel. When INBD package 255 is enabled values for both the PRI loop number (LOOP) and the D-channel interface identifier (ID) must be entered. For large systems (Options 51C, 61C, 81C).
	LOOP ID 1-9 (0)-15	Primary PRI2 loop number and interface identifier for the D-channel, for the small system (Option 11C). When INBD package 255 is enabled values for both the PRI loop number (LOOP) and the D-channel interface identifier (ID) must be entered.
- PRI	0-159 1-126 (LOOP) (ID)	Secondary PRI loop number and interface identifier, for nB+D (prompted if INBD package 255 is enabled). The values entered must be different than those entered for the loop number and interface identifier at the DCHL prompt. For large systems (Options 51C, 61C, 81C). The PRI prompt is generated until <CR> is entered.
	LOOP ID 1-9 (0)-15	Secondary PRI loop number and interface identifier (prompted if INBD package 255 is enabled). The values entered must be different than those entered for the loop number and interface identifier at the DCHL prompt. For the small system (Option 11C).
PRI	<CR>	End configuration.

LD 73 – Define the digital pad tables, per country requirement.

Prompt	Response	Description
REQ	NEW CHG OUT END PRT	NEW = Add new data. CHG = Change existing data. OUT = Remove existing data. END = Exit LD 73. PRT = Print specified data.
TYPE	PRI2	2.0 Mb Primary Rate Interface.
FEAT	PAD	Feature is digital pad.

PDCA	(1)-16	Pad category table number.
TNLS	YES NO	Print TN list (if REQ = PRT).
DFLT	(1)-16	Default table (when REQ = NEW).

For the following prompts, **x = Rx code (receive) and y = Tx code (transmit)**. You may assign receive and transmit dB values to the prompts by entering a code which corresponds to a dB value.

Note: For North America, use the following values.

ONP	Rx Tx	On Premise Extension. Rx = 8 Tx = -4
DSET	Rx Tx	Meridian Digital Set. Rx = 8 Tx = -4
OPX	Rx Tx	Off Premise Extension. Rx = 8 Tx = -4
DTT	Rx Tx	Digital TIE trunks. Rx = 0 Tx = 0
SDTT	Rx Tx	Digital Satellite Tie trunks. Rx = 6 Tx = 0
DCO	Rx Tx	1.5 Mb DTI/PRI Digital COT, FEX, WAT, DID trunks. Rx = 3 Tx = 3
VNL	Rx Tx	Via Net Loss Analog TIE trunk. Rx = 3 Tx = 0
SATT	Rx Tx	Analog Satellite TIE trunk. Rx = 6 Tx = 0

ACO	Rx Tx	Analog CO trunk. Rx = 6 Tx = -3
PRI	Tx Rx	1.5 Mb PRI trunk. Applicable when Port Type at far end is PRI for the route (PTYP prompt = PRI in LD 16). Rx = 0 Tx = 0
PRI2	Tx Rx	2.0 Mb DI/PRI trunk. Rx = 0 Tx = 0
XUT	Rx Tx	Extended Peripheral Equipment Universal trunk. Rx = 6 Tx = -3
XEM	Rx Tx	Extended Peripheral Equipment E&M trunk. Rx = 6 Tx = 0

LD 16 – Configure a PRI2 route.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	RDB	Route Data Block.
CUST	xx	Customer number, as already defined in LD 15. xx = 0-99 for large systems (Options 51C, 61C, 81C). xx = 0-31 for the small system (Option 11C).
ROUT	xxx	Route number. xxx = 0-511 for large systems (Options 51C, 61C, 81C). xxx = 0-127 for the small system (Option 11C).
DES	PRI2	Designator field for trunk.
TKTP	TIE	TIE trunk type (this is the only type allowed).
...		

DTRK	YES	Digital trunk route.
- DGTP	PRI2	2.0 Mb PRI digital trunk.
ISDN	YES	Integrated Services Digital Network.
- MODE	PRA	ISDN PRI route.
- IFC	SL1	SL-1 interface (Meridian 1 to Meridian 1 connectivity).
- - PNI	(0)-32700	Private Network identifier.
- NCNA	YES	Network Calling Name allowed.
- NCRD	YES	Network Call Redirection allowed.
...		
ICOG	IAO	Incoming and Outgoing trunks.
SRCH	(LIN) RRB	Search method for outgoing trunk member. LIN = Linear Hunt search method. RRB = Round Robin search method.
...		
ACOD	xxx..x	One-seven-digit access code for the trunk route.
...		
SIGO	aaaa	Signaling Arrangement. aaaa = (STD), ESN2, ESN3, ESN5, ETN, EN19.
...		

LD 14 – Configure PRI2 trunks.

Prompt	**Response**	**Description**
REQ	NEW CHG	Add new data. Change existing data.
TYPE	TIE	TIE trunk data block.

TN	l ch	Loop and channel for digital trunks, where: l = Previously defined PRI2 loops. ch = channel 1-30.
		For large systems (Options 51C, 61C, 81C).
	c u	c = card. u = unit.
		For the small system (Option 11C).
DES	PRI2	Designator field for trunk.
PDCA	(1)-16	Pad category table number.
PCML		Pulse Code Modulation Law. Enter the appropriate value, based on which companding law is being used on the Meridian 1.
	A MU	A = A-Law. MU = u-Law.
CUST	xx	Customer number, as already defined in LD 15. xx = 0-99 for large systems (Options 51C, 61C, 81C). xx = 0-31 for the small system (Option 11C).
NCOS	(0)-99	Network Class of Service group.
RTMB	0-511 1-510 0-127 1-510	Route number and member number. For Option 11C.
MNDN	xxx..x	One-seven digit manual Directory Number.
TGAR	0 - (1) - 31	Trunk Group Access Restriction. The default of 1 automatically blocks direct access.
CLS	aaaa	Class of Service.
...		

DTI2 implementation

To configure DTI2 on a Meridian 1 large system or small system PBX, use the following steps:

- Configure the Pulse Code Modulation Conversion value, using LD 15.
- Configure a DTI2 interface, using LD 17.
- Define the DTI2 pad tables, using LD 73.

- Configure a PRI2 route, using LD 16.
- Configure a PR2 trunk, using LD 14.
- Define the ABCD (signaling category) table, using LD 73. ABCD tables apply to DTI/DTI2 interfaces only.

LD 15 - Configure the Pulse Code Modulation Conversion value on the Meridian 1 PBX.

Prompt	Response	Description
REQ:	CHG	Change existing data.
TYPE:	NET	Make changes to networking data.
CUST	xx	Customer number. xx = 0-99 for large systems (51C, 61C, and 81C). For the small system (Option 11C).
...		
ISDN	YES	Integrated Services Digital Network.
...		
- RCNT	0-(5)	Redirection Count for ISDN calls.
- - PCMC	0-(15)-31	The number of Pulse Code Modulation Conversions allowed, from u-Law to A-Law or A-Law to u-Law, in a network connection.
...		

LD 17 – Configure a DTI2 interface on the Meridian 1 PBX.

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	CEQU	Make changes to Common Equipment parameters.
...		
- DTI2	0-159	DTI2 loop number.
...		

LD 16 – Configure a DTI2 route.

Prompt	Response	Description
REQ	NEW	Add new data.
TYPE	RDB	Route Data Block.
CUST	xx	Customer number, as already defined in LD 15.
ROUT	xxx	Route number. xxx = 0-511 for large systems (Options 51C, 61C, 81C). xxx = 0-127 for the small system (Option 11C).
DES	DTI2	Designator field for trunk.
TKTP	TIE	TIE trunk type (this is the only type allowed).
...		
DTRK	YES	Digital trunk route.
- DGTP	DTI2	2.0 Mb digital trunk.
ISDN	YES	Integrated Services Digital Network.
...		
ICOG	IAO	Incoming and Outgoing trunks.
SRCH		Search method for outgoing trunk member.
	(LIN) RRB	Linear Hunt search method. Round Robin search method.
...		
ACOD	xxx..x	One-seven-digit access code for the trunk route.
...		
SIGO	aaaa	Signaling Arrangement. aaaa = (STD), ESN2, ESN3, ESN5, ETN, EN19.
...		

LD 14 – Configure DTI2 trunks.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	TIE	TIE trunk data block.
TN	 l ch c u	Loop and channel for digital trunks, where: l = Previously defined PRI2 loops. ch = channel 1-30. For large systems (Options 51C, 61C, 81C). c = card. u = unit. For the small system (Option 11C).
DES	DTI2	Designator field for trunk.
PDCA	(1)-16	Pad category table number.
PCML	 A MU	Pulse Code Modulation Law. Enter the appropriate value, based on which companding law is being used on the Meridian 1. A = A-Law. MU = u-Law.
CUST	xx	Customer number, as already defined in LD 15.
NCOS	(0)-99	Network Class of Service group.
RTMB	0-511 1-510 0-127 1-510	Route number and member number. For Option 11C.
MNDN	xxx..x	One-seven digit manual Directory Number.
TGAR	0 - (1) - 31	Trunk Group Access Restriction. The default of 1 automatically blocks direct access.
CLS	aaaa	Class of Service.
...		

LD 73 – Define the digital pad tables, per country requirement.

Prompt	Response	Description
REQ	NEW CHG OUT END PRT	NEW = Add new data. CHG = Change existing data. OUT = Remove existing data. END = Exit LD 73. PRT = Print specified data.
TYPE	DTI2	2.0 Mb Digital Trunk Interface.
FEAT	PAD	Feature is digital pad.
PDCA	(1)-16	Pad category table number.
TNLS	YES NO	Print TN list (if REQ = PRT).
DFLT	(1)-16	Default table (when REQ = NEW).
For the following prompts, **x = Rx code (receive) and y = Tx code (transmit)**. You may assign receive and transmit dB values to the prompts by entering a code which corresponds to a dB value. ***Note:*** For North America, use the following values.		
ONP	Rx Tx	On Premise Extension.
ONP	Rx Tx	On Premise Extension. Rx = 8 Tx = -4
DSET	Rx Tx	Meridian Digital Set. Rx = 8 Tx = -4
OPX	Rx Tx	Off Premise Extension. Rx = 8 Tx = -4
DTT	Rx Tx	Digital TIE trunks. Rx = 0 Tx = 0
SDTT	Rx Tx	Digital Satellite Tie trunks. Rx = 6 Tx = 0

DCO	Rx Tx	1.5 Mb DTI/PRI Digital COT, FEX, WAT, DID trunks. Rx = 3 Tx = 3
VNL	Rx Tx	Via Net Loss Analog TIE trunk. Rx = 3 Tx = 0
SATT	Rx Tx	Analog Satellite TIE trunk. Rx = 6 Tx = 0
ACO	Rx Tx	Analog CO trunk. Rx = 6 Tx = -3
PRI	Tx Rx	1.5 Mb PRI trunk. Applicable when Port Type at far end is PRI for the route (PTYP prompt = PRI in LD 16). Rx = 0 Tx = 0
PRI2	Tx Rx	2.0 Mb DI/PRI trunk. Rx = 0 Tx = 0
XUT	Rx Tx	Extended Peripheral Equipment Universal trunk. Rx = 6 Tx = -3
XEM	Rx Tx	Extended Peripheral Equipment E&M trunk. Rx = 6 Tx = 0

LD 73 – Configure an ABCD (signaling category table). ABCD tables apply only to DTI/DTI2 interfaces. This step is optional.

Before configuring the ABCD tables, you may refer to the section "Signaling category (ABCD tables) assignment and modification" on page 125, which explains ABCD tables assignment and modification.

Please refer to the following tables when configuring the ABCD table values:

- Table 22, "Default values for Signaling Categories 1 and 16 (In/Out Calls)," on page 123.
- Table 23, "Default values for Signaling Categories 1 and 16 (Incoming Calls)," on page 124.
- Table 24, "Default values for Signaling Categories 1 and 16 (Outgoing Calls)," on page 124.

Prompt	Response	Comment
REQ	aaa	Request (aaa = CHG, END, NEW, OUT, or PRT).
TYPE	aaa	Type of data block.
FEAT	ABCD	Feature = ABCD.
SICA	2-16	Signaling Category.
TNLS	(NO) YES	Terminal Number List.
DFLT	(1)-16	Default signaling category to be used for Default values.
Prompts for Incoming/Outgoing Calls		
IDLE (S)	abcd	Idle.
IDLE (R)	abcd	Idle.
FALT (S)	abcd	Fault (DTI out-of-service).
FALT (R)	abcd	Fault (DTI out-of-service).
P RRC (S)	abcd	Register Recall.

- TIME	10-(100)-630	Time of RRC (S) in milliseconds.
TIME	(0)-1920	Persistence Time required before signal is accepted.
Prompts for Incoming Calls		
SEZ (R)	abcd	Seize for voice or data calls from a non-SL-1.
E SEZ (R)	abcd	Seize for voice or data calls from a non-SL-1.
- TIME	16-(56)-1000 16-(296)-1000.	
		Minimum and maximum acceptable pulse duration.
SEZD (R)	abcd	Seize for data calls between SL-1s.
- SEZV (R)	abcd	Seize for voice calls.
P CALL (R)	abcd	Signal sent during seize by an incoming CO trunk.
- TIME	1-(2)-15 1-(8)-15	
		Pulse on time, pulse off time.
SEZA (S)	abcd	Seize Acknowledgment.
- TIME	50-80-90	Time delay prior to sending SEZA.
PRCS (S)	abcd	PRCS.
WNKS (S)	abcd	Wink Start.
P WNKS (S)	abcd	Wink Start.
- TIME	10-(220)-630	Time for P WNKS (S).
P DIGT (R)	abcd	Decadic pulses.
NRCV (S)	abcd	Number Received.
P EOSF (S)	abcd	End of Selection Free.
- TIME	(100)-150	Time for EOSF (S).

- P EOSB (S)	abcd	End of Selection Busy.
- - TIME	(100)-150	Time for EOSB (S).
P OPC (R)	abcd	Operator Calling.
- TIME	64-(128)-192	Time of OPCA (R) pulse.
- TIME	16-(96)-1000	16-(160)-1000 Minimum and maximum acceptable pulse duration.
- REPT	(1)-5	Number of OPCA (R) pulses.
CONN (S)	abcd	Connect.
E CON (S)	abcd	Connect.
- TIME	10-(150) 630	Time of pulse length in 10 ms increments.
CONN (R)	abcd	Connect.
P BURS (S)	abcd	Bring Up Receiver for L1 networking.
P BURS (R)	abcd	Bring Up Receiver for L1 networking.
- TIME	64-(128)-192	Time for BURS (R) pulse.
CLRB (S)	abcd	Clear Back.
C CLRB (S)	abcd	Clear Back.
- TIME	10-(600)-2000	Time of pulse length in 10 ms increments.
- P RCT (S)	abcd	Release Control.
- - TIME	100-(150) 300	Time value is stored in 10 ms increments.
- - P RCOD (S)	abcd	Release Control Originating party Disconnect.
- - - TIME	150	Timer value in milliseconds is fixed.
P OPRS (R)	abcd	Operator manual recall.

- TIME	xxxx yyyy	Minimum and maximum time range for OPRS (R).
P NXFR (S)	abcd	Network Transfer.
P ESNW (S)	abcd	ESN Wink.
P CAS (S)	abcd	Centralized Attendant.
CLRF (R)	abcd	Clear Forward.
- SOS	abcd	Special Operator Signal.
P BRLS (S)	abcd	Backward Release.
- TIME	10-(600)-2000	Time of pulse length in 10 ms increments.
P FRLS (R)	abcd	Forward Release.
- TIME	16-(296)-2000	16-(960)-2000
		Minimum and maximum acceptable pulse duration.
Prompts for Outgoing Calls		
SEZ (S)	abcd	Seize for voice or data calls to a non-SL-1.
E SEZ (S)	abcd	Seize for voice or data calls to a non-SL-1.
- TIME	10-(150)-630	Time of pulse length in 10 ms increments.
SEZD (S)	abcd	Seize for Data calls.
- SEZV (S)	abcd	Seize for Voice calls.
SEZA (R)	abcd	Seize Acknowledgment.
- TIME	xxx	Delay time for the SEZA signal (xxx = 50, 80, 90, (150), or 800).
WNKS (R)	abcd	Wink Start.
- TIME	20-(140)-500	20-(290)-500
		Minimum and maximum length of WNKS (R) pulse.

P WNKS (R)	abcd	Wink Start.
- TIME	16-(136)-504 16-(288)-504	
		Minimum and maximum length of P WNKS (R) pulse.
P EOS (R)	abcd	End of Selection.
- TIME	(64)-320 64-(256)-320	
		Length of EOS (R) pulse.
CONN (S)	abcd	Connect.
CONN (R)	abcd	Connect.
E CONN (R)	abcd	Connect.
- TIME	16-(56)-1000 16-(296)-1000	
		Time of pulse length in 8 ms increments.
P OPRC (R)	abcd	Operator Recall for special services.
P BURS (S)	abcd	Bring Up Receiver for L1 networking.
P BURS (R)	abcd	Bring Up Receiver for L1 networking.
- TIME	64-(128)-192	Time for BURS (R) pulse.
CLRB (R)	abcd	Clear Back.
C CLRB (R)	abcd	Clear Back.
- TIME	16-(296)-2000 16-(960)-2000	
		Time of pulse length in 8 ms increments.
- P RCTL (R)	abcd	Release Control.
- - TIME	96-(128)-320 96-(256)-320	
		Time stored in 8 ms increments.

P NXFR (R)	abcd	Network Transfer.
P ESNW (R)	abcd	ESN Wink.
P CAS (R)	abcd	Centralized Attendant Service.
CLRF (S)	abcd	Clear Forward.
- TIME	(0)-800	Time in milliseconds.
- SOS	abcd	Special Operator Signal.
P FRLS (S)	abcd	Forward Release.
- TIME	10-(600)-2000	Only prompted for pulsed signals.
P BRLS (R)	abcd	Backward Release.
- TIME	16-(296)-2000	16-(960)-2000 Time of pulse length in 8 ms increments.
C SUPO (S)	abcd	Complex Supervision to Operator Signal used for KD3 signaling. Note that the input for a must be C.

Table 22
Default values for Signaling Categories 1 and 16 (In/Out Calls)

In/Out Calls	SICA 1	SICA 16
IDLE (S)	1001	1101
IDLE (R)	1001	1101
FALT (S)	1101	0101
FALT (R)	1101	0101
TIME	0	0
P RRC (S)	UNUSED	UNUSED

Table 23
Default values for Signaling Categories 1 and 16 (Incoming Calls)

Incoming Calls	SICA 1	SICA 16	Incoming Calls	SICA 1	SICA 16
E SEZ (R)	0001	0101	CONN (R)	0001	0101
SEZD (R)	UNUSED	UNUSED	P BURS (S)	UNUSED	UNUSED
SEZV (R)	UNUSED	UNUSED	P BURS (R)	UNUSED	UNUSED
P CALL (R)	UNUSED	UNUSED	C CLRB (S)	1101	1101
SEZA (S)	1101	UNUSED	P RCTL (S)	UNUSED	UNUSED
TIME	150		P RCOD (S)	UNUSED	UNUSED
PRCS (S)	UNUSED	UNUSED	P OPRS (R)	UNUSED	UNUSED
P WNKS (S)	UNUSED	PXXX	P NXFR (S)	UNUSED	UNUSED
TIME		220	P ESNW (S)	UNUSED	UNUSED
P DIGT (R)	UNUSED	PXXX	P CAS (S)	UNUSED	UNUSED
NRCV (S)	UNUSED	UNUSED	CLRF (R)	UNUSED	UNUSED
P EOSF (S)	UNUSED	UNUSED	SOS (R)	UNUSED	UNUSED
P EOSB (S)	UNUSED	UNUSED	P BRLS (S)	UNUSED	UNUSED
P OPCA (R)	UNUSED	UNUSED	P FRLS (R)	UNUSED	UNUSED
E CONN (S)	0101	0101			

Table 24
Default values for Signaling Categories 1 and 16 (Outgoing Calls)

Outgoing Calls	SICA 1	SICA 16
E SEZ (S)	0001	0101
SEZD (S)	UNUSED	UNUSED
SEZV (S)	UNUSED	UNUSED
SEZA (R)	1101	UNUSED
P WNKS (R)	UNUSED	PXXX
TIME		136 288

Outgoing Calls	SICA 1	SICA 16
P EOS (R)	UNUSED	UNUSED
CONN (S)	0001	0101
E CONN (R)	0101	0101
P OPRC (R)	UNUSED	UNUSED
P BURS (S)	UNUSED	UNUSED
P BURS (R)	UNUSED	UNUSED
C CLRB (R)	1101	1101
P RCTL (R)	UNUSED	UNUSED
P NXFR (R)	UNUSED	UNUSED
P ESNW (R)	UNUSED	UNUSED
P CAS (R)	UNUSED	UNUSED
CLRF (S)	UNUSED	UNUSED
SOS (R)	UNUSED	UNUSED
P FRLS (S)	UNUSED	UNUSED
P BRLS (R)	UNUSED	UNUSED

Signaling category (ABCD tables) assignment and modification

What can be entered for the abcd response?

Prompts which show the response abcd, such as IDLE (S), require a four field response to indicate the status of four bits: a, b, c and d. The abcd response represents a trunk supervisory message. The bit states within the message are determined by using the appropriate input. Allowable inputs for each bit are: 0, 1, C, P, U, X, N. These input options are explained as follows:

- 0 - Bit is a steady state 0 (LOW) e.g. 0000 bits abcd are all steady state 0.
- 1 - Bit is a steady state 1 (HIGH) e.g. 0101 bits b and d are steady state 1 while bits a and c are steady state 0.
- C - Bit is pulsed and present continuously (Continuous pulsing of two or more bits is not allowed.).

— "C" can only be entered for signals that have "C" in front of them when the signal is prompted; the signals are: "C CLRB (S), C CLRB (R) and C SUPO (S) UNUSED"

— "C" cannot be mixed with 0 or 1 or P in the ABCD pattern. Therefore, the entry must look like CXXX, XCXX, etc.

— "C" can only be entered once in the ABCD pattern

- C cannot be entered for the CLRB (R) or CLRB (S) prompts if the pulsed E&M package (232) PEMD is equipped - Bit is pulsed. e.g. PC10 bit a is pulsed, bit b is pulsed and sent continuously, bit c is steady state 1 and bit d is steady state 0.
- U - Bit is a don't-care bit (for received signals only) e.g. U10U bits a and d are don't-care bits, bit b is steady state 1 and bit c is steady state 0.
- X - Bit is not to be changed (used in conjunction with Pulsed or Continuously pulsed bit) e.g. XPXX bits a, c and d are unchanged, bit b is set to steady state 1 and bit c is set to steady state 0.

Another input to the signal name prompt is allowed. The other allowable input is:

- N - The signal is not required.

How to tell if the signal is pulsing, pulsed or steady?

The signal type is identified by a single character followed by a blank space preceding the signal name. For example, the prompt E SEZ(R) indicates that the Seize signal may be either Pulsed or steady state. The signal type identifiers are:

- C - Continuous Pulsing, Pulsed or steady state
- E - Pulsed or steady state
- P - Pulsed (single pulse unless otherwise indicated)
- No preceding character indicates the signal is steady state only

Pulsed signals will output the TIME prompt. This prompt is described for each of the signals that may prompt it.

How to determine signal direction?

The direction of the signal is indicated by a single character in brackets at the end of the signal name:

- (R) - Indicates that the signal is to be received by the switch
- (S) - Indicates that the signal is to be sent by the switch

For example, E SEZ (R) indicates that the Seize signal may be either Pulsed or steady state and that the signal is to be received by the switch.

How to tell if the prompt is incoming or outgoing, or both

ABCD prompts correspond to incoming calls, outgoing calls or both incoming and outgoing calls. Prompts IDLE (S) to P RRC correspond to incoming/outgoing calls. Prompts E SEZ (R) to P FRLS (R) correspond to incoming calls. Prompts E SEZ (S) to C SUPO (S) correspond to outgoing calls.

Feature operation

No specific operating procedures are required to use this feature.

510 Trunk Route Member Expansion

Contents

The following are the topics in this section:

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Feature Description

The 510 Trunk Route Member Expansion feature allows a customer to configure a maximum of 510 trunk route members per route (range 1-510). The previous maximum was 254 (range 1-254).

The need for this expansion was particularly evident for a Meridian 1 to DMS Central Office connectivity, where the full potential of a T-1 nB+D configuration (384 B-Channels) or an E-1 nB+D configuration (480 B-Channels) was not able to be realized. The DMS supports one D-Channel per route. With a limit of 254 route members per D-Channel, this meant that the maximum offered by nB+D could not be utilized.

With the 510 Trunk Route Member Expansion feature implemented, when connecting a Meridian 1 to another Meridian 1, or a Meridian 1 to a DMS Central Office PBX, users now have greater flexibility when configuring their systems.

For a Meridian 1 to Meridian 1 connectivity, a user is now able to configure, on one trunk route, one D-Channel with 382 (T1) or 480 (E1) B-Channels, a Backup D-Channel, and a second D-Channel with another 128 (T1) or 30 (E1) B-Channels. If desired, another Backup D-Channel may be configured. Refer to Figure 2 for a T1 representation, and to Figure 3 for an E1 representation.

For a Meridian 1 to DMS connectivity, a user may now configure the full complement of nB+D, which is one D-Channel with 382 (T1) or 480 (E1) B-Channels, and a Backup D-Channel. Refer to Figure 4 for a T1 representation, and to Figure 5 for an E1 representation.

Figure 2
510 trunk members expansion configured for a Meridian 1 to Meridian 1 connectivity (T1)

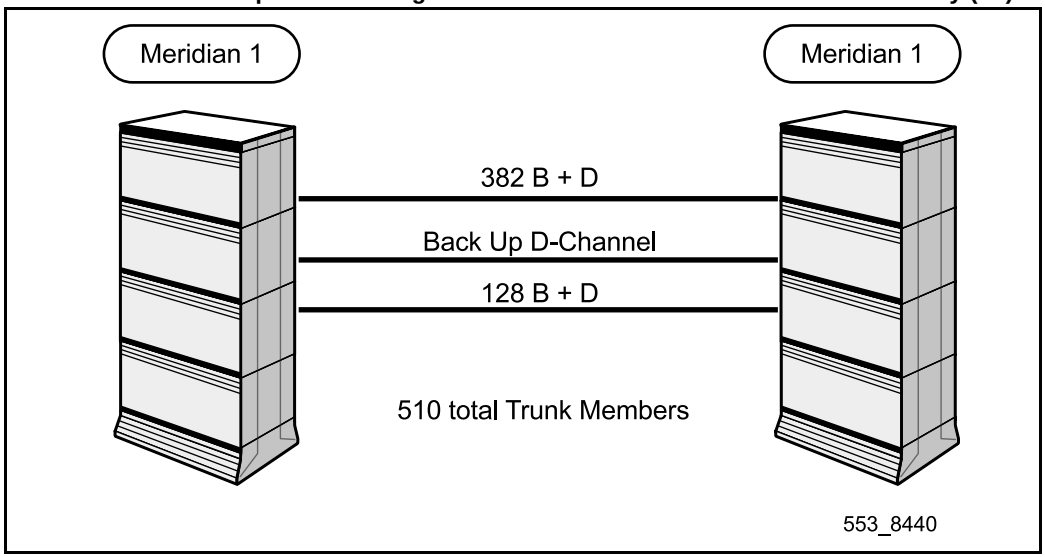


Figure 3
510 trunk members expansion configured for a Meridian 1 to Meridian 1 connectivity (E1)

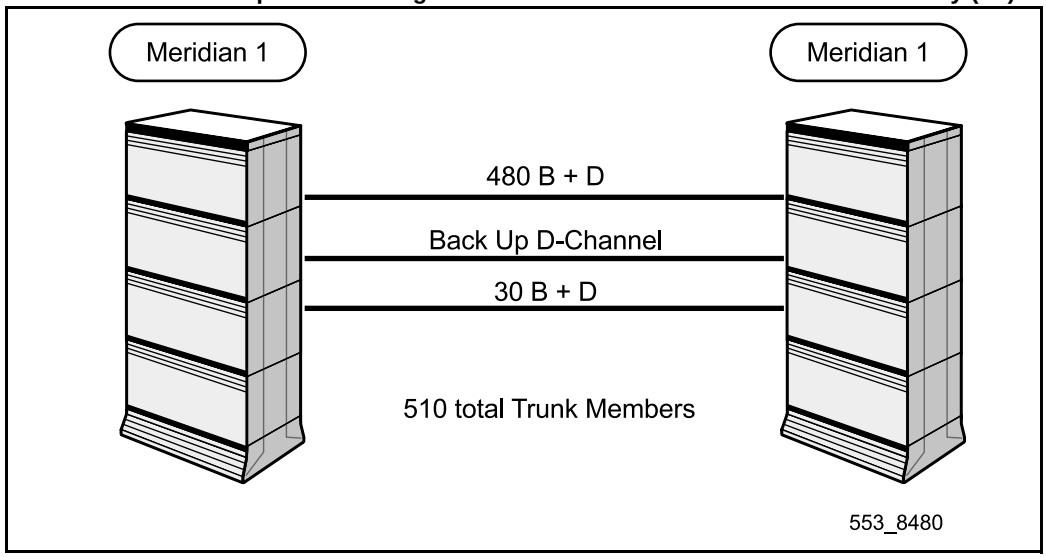


Figure 4
510 trunk members expansion configured for a Meridian 1 to DMS connectivity (T1)

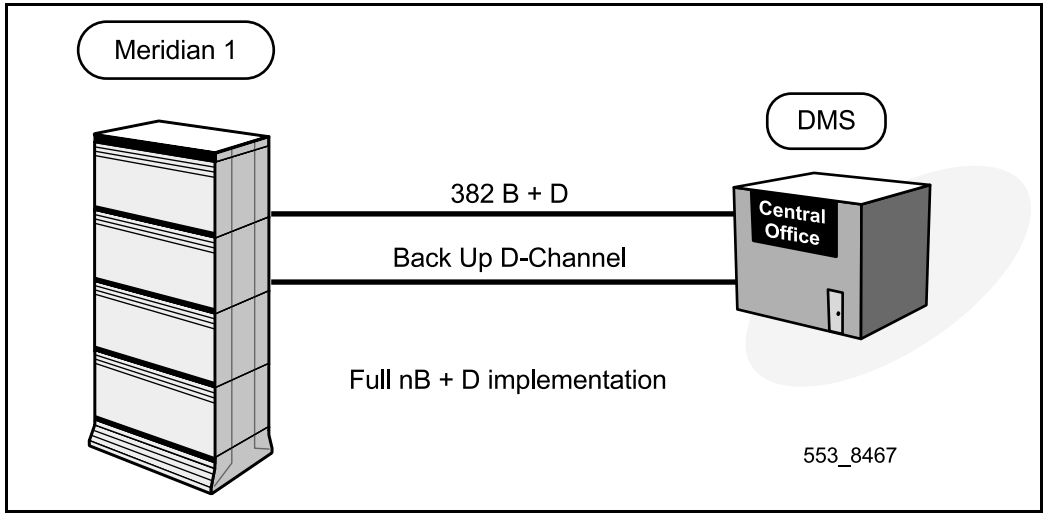
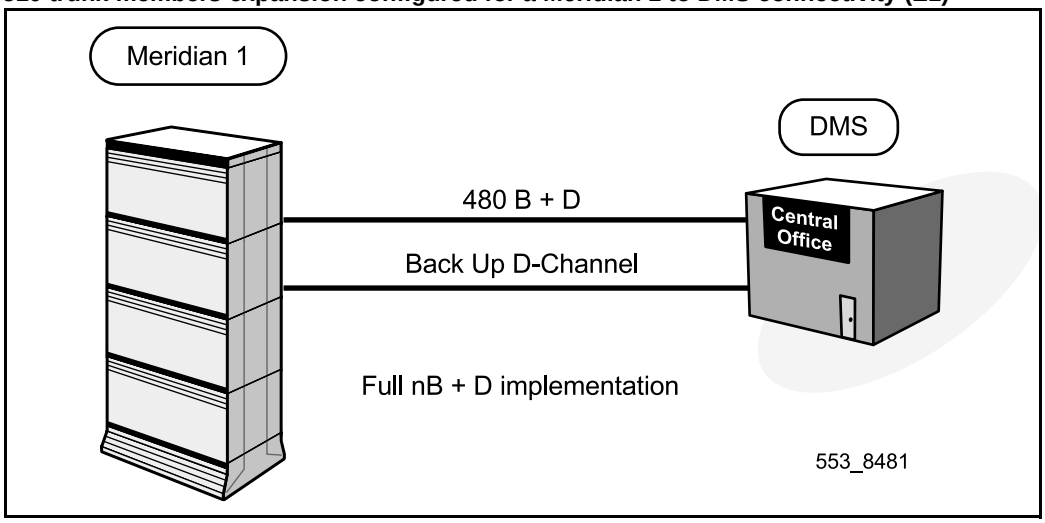


Figure 5
510 trunk members expansion configured for a Meridian 1 to DMS connectivity (E1)



This feature applies to the following trunk mode configurations:

- PRI/PRI2 mode
- DTI/DTI2 mode
- Shared mode
- Virtual Network Services (VNS)
- ISL mode
- Analog mode
- ISDN Basic Rate Interface (BRI) trunk mode

  Note: ISDN BRI trunking is not supported in North America.

The following trunk types are supported:

- Integrated Services Access (ISA)
- NI-2 Call By Call Service Selection (CBCT)

  Note: Integrated Services Access and NI-2 Call By Call Service Selection are only supported in North America.

- FGDT (Feature Group D)
- COT (Central Office)
- TIE
- DID (Direct Inward Dial)
- FEX (Foreign Exchange)
- WATS (Wide Area Telecommunications Service)

The overlay programs that are affected are:

- LD 14 the Trunk Data Block
- LD 16, the Route Data Block
- LD 27, for ISDN BRI trunking

  Note: ISDN BRI trunking is not supported in North America.

Maintenance routines are also affected. For the Call Trace LD 80, the TRAC c r m (trace calls, customer c, member m) is modified to allow “member” input from 1 to 510.

For the Automatic Trunk Maintenance LD 92, the ATMR c r m (Test customer c, route r, member m) is modified to allow “member” input from 1 to 510.

For traffic measurements, in the Customer Traffic Measurement Output report TFC002, the total number of trunks for the “Trunks Equipped” and “Trunks Working” fields has been increased to a maximum of 510.

In the CDR output format, the Originating Identification (ORIGID) and Terminating Identification (TERID) fields now displays the trunk route member field in the range 1-510.

Operating parameters

There are no operating parameters for this feature.

Feature interactions

Integrated Services Access

The ISA minimum (MIN) and maximum (MAX) fields for service routes may be configured in LD 16 at a value from 0-510.

NI-2 Call By Call Service Selection

The NI-2 Call By Call Service Selection maximum (MAX) field for service routes may be configured in LD 16 at a value from 0-510.

Preference Trunk Usage

The Preference Trunk Usage Threshold (PTUT) in LD 16 may be configured at a value from 0-510.

Meridian MAX

The Meridian MAX configuration does not support the 510 trunk member expansion. The Meridian 1 system software maps all trunk members which are greater than 254 (from 254-510) to trunk number 0, in the High Speed Link protocol.

For the Meridian MAX report, the MAX software collects all call statistics associated with trunk number 255 to trunk number 510, and displays the pegged value in the trunk number 0 field.

Feature packaging

The following packages are required:

- Basic (BASIC) package 0
- Basic Rate Interface Trunk (BRIT) package 233, for BRI trunking applications

Feature implementation

Task summary list

The following is a summary of the tasks in this section

For supported trunks other than ISA and NI-2 CBC trunks:

1 LD 16 - Define the trunk route.

2 LD 14 - Define the trunk type, and the route member number.

3 LD 27 - Define the trunk type as BRIT, and the route member number on a Digital Subscriber Loop (DSL).

For ISA trunks:

4 LD 16 – Define the ISA master route.

5 LD 14 - Define the trunk type as ISA, and the route member number.

6 LD 16 - Define the maximum and minimum number of channels per ISA service route.

For NI-2 CBC trunks

7 LD 16 – Define the NI-2 CBC master route.

8 LD 14 - Define the trunk type as NI-2 CBC, and the route member number.

9 LD 16 - Define the maximum number of channels per NI-2 service route.

For supported trunks other than ISA and NI-2 CBC trunks

LD 16 - Define the trunk route.

Prompt	Response	Description
REQ	NEW CHG	Add a new data. Change existing data.
TYPE	RDB	Route Data Block.
CUST	xx	Customer number, as already defined in LD 15. xx = 0-99 for Options 51C-81C. xx = 0-31 for Option 11C.
ROUT	0 - 511 0-127	Route Number for Options 51C-81C. Route Number for Option 11C.
DES	x...x	Designator field for trunk (0-16 alphanumeric characters).

TKTP		Supported trunk type (other than ISA or CBC).
	COT TIE DID FEX WAT FGDT	Central Office. TIE Direct Inward Dial. Foreign Exchange. Wide Area Telecommunications Service. Feature Group D.
...		
DTRK	(NO) YES	Define whether or not the trunk route is digital. Enter NO for analog, YES for digital.
- DGTP	PRI	For digital trunks, enter PRI as the digital trunk type. This prompt appears only if DTRK = YES.
...		
ISDN		Integrated Services Digital Network option.
	(NO) YES	Enter NO for analog trunks or YES for digital trunks.
- MODE	aaaa	Mode of operation, where aaaa can be: APN = Analog Private Network. ISLD = ISDN Signaling Link. PRA = Primary Rate Access (ISDN must be YES).
- IFC	aaaa	Interface type, where aaaa can be: D100 = DMS-100. D250 = DMS-250. SL1 = Meridian 1 (the default value).
...		
NSF	YES	Network Service Facility option. This option is used to indicate to the Meridian 1 whether it is to expect a Network Service Facility (NSF) Information Element (IE) from the DMS. The NSF information dictates which service route the Meridian 1 will use to terminate a call. Enter YES. The default value is NO.
...		

ICOG	aaa	Incoming or outgoing trunk type, where aaa can be: ICT = Incoming only. OGT = Outgoing only. IAO = Both incoming and outgoing.
...		

LD 14 - Define the trunk type, and the route member number.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE		Trunk type.
	COT TIE DID FEX WAT FGDT	Central Office. TIE. Direct Inward Dial. Foreign Exchange. Wide Area Telecommunications Service. Feature Group D.
...		
TN	 l s c u	TN address, for Options 51C-81C, where: l = loop s= shelf c = card u = unit.
	c u	TN address, for Option 11C, where: c = card u = unit.
...	l ch	Loop and channel for digital trunks, for Options 51C-81C, where: l = loop ch = channel.
	c ch	Card and channel for digital trunks, for Option 11C. c = card ch = channel.
CUST	xx	Customer number, as already defined in LD 15. xx = 0-99 for Options 51C-81C xx = 0-31 for Option 11C.
...		

RTMB ...	0-511 1-510 0-127 1-510	Route number and member number, for Options 51C-81C. Route number and member number, for Option 11C.

LD 27 - Define the trunk type as BRIT, and the route member number on a Digital Subscriber Loop (DSL).

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	DSL	Administer the DSL data block.
DSL		DSL address for Options 51C-81C.
	l s c dsl#	l (superloop) = 0-156 (must be a number divisible by 4). s (shelf) = 0-1. c (card) = 0-15. dsl# (DSL location) = 0-7.
		DSL address for Option 11C.
	c dsl#	c (card) = 1-9. dsl# (DSL location) = 0-7.
DES	d...d	DSL designator (1 to 6 alphanumeric characters).
APPL	aaaa	Basic Rate Interface application (BRIT or BRIE).
...		
B1	(NO) YES	(Do not) change B-Channel 1 configuration.
- MEMB	1-510	Member number of BRI route.
...		
B2	(NO) YES	(Do not) change B-Channel 2 configuration.
- MEMB	1-510	Member number of BRI route.
...		

For ISA trunks

LD 16 – Define the ISA master route.

Prompt	Response	Description
REQ	NEW CHG	Add a new data. Change existing data.
TYPE	RDB	Route Data Block.
CUST	xx	Customer number, as already defined in LD 15. xx = 0-99 for Options 51C-81C. xx = 0-31 for Option 11C.
ROUT	0 - 511 0-127	Route Number for Options 51C-81C. Route Number for Option 11C.
TKTP	ISA	Create an ISA master route.
...		
DTRK	YES	The trunk route is digital.
- DGTP	PRI	For digital trunks, enter PRI as the digital trunk type. This prompt appears only if DTRK = YES.
...		
ISDN	YES	Integrated Services Digital Network option.
- MODE	PRA	Mode of operation is Primary Rate Access.
- IFC	aaaa	Interface type, where aaaa can be: D100 = DMS-100. D250 = DMS-250. SL1 = Meridian 1 (the default value).
...		
ICOG	aaa	Incoming or outgoing trunk type, where aaa can be: ICT = Incoming only. OGT = Outgoing only. IAO = Both incoming and outgoing.
...		

LD 14 - Define the trunk type as ISA, and the route member number.

Prompt	Response	Description
REQ	NEW xxx	Add new data. Follow NEW with xxx = 1-510, to create that number of consecutive trunks.
TYPE	ISA	ISA trunk type.
TN	l s c u	TN address, for Options 51C-81C, where: l = loop s= shelf c = card u = unit.
	c u	Card and unit, for Option 11C, where: c = card u = unit.
...	l ch	Loop and channel for digital trunks, for Options 51C-81C, where: l = loop ch = channel.
	c ch	Card and channel for digital trunks, for Option 11C. c = card ch = channel
...		
CUST	xx	Customer number, as already configured in LD 15. xx = 0-99 for Options 51C-81C xx = 0-31 for Option 11C.
...		
RTMB	0-511 1-510 0-127 1-510	Route number and member number, for Options 51C-81C. For Option 11C.
...		

LD 16 - Define the maximum and minimum number of channels per ISA service route.

Prompt	Response	Description
REQ	NEW CHG	Add a new data. Change existing data.
TYPE	RDB	Route Data Block.
CUST	xx	Customer number, as already defined in LD 15. xx = 0-99 for Options 51C-81C. xx = 0-31 for Option 11C.
ROUT	0 - 511 0-127	Route Number for Options 51C-81C. Route Number for Option 11C.
TKTP	aaaa	Type of ISA service route.
...		
DTRK	YES	The trunk route is digital.
- DGTP	PRI	For digital trunks, enter PRI as the digital trunk type. This prompt appears only if DTRK = YES.
...		
ISDN	YES	Integrated Services Digital Network option.
- MODE	PRA	Mode of operation is Primary Rate Access.
- IFC	aaaa	Interface type, where aaaa can be: D100 = DMS-100. D250 = DMS-250. SL1 = Meridian 1 (the default value).
...		
- ISAR	YES	ISA service route.
- - MIN	0-510	Minimum number of channels allowed on an ISA service route.
- - MAX	0-510	Maximum number of channels allowed on an ISA service route.
...		

ICOG ...	aaa	Incoming or outgoing trunk type, where aaa can be: ICT = Incoming only. OGT = Outgoing only. IAO = Both incoming and outgoing.

For NI-2 CBC trunks

LD 16 – Define the NI-2 CBC master route.

Prompt	Response	Description
REQ	NEW CHG	Add a new data. Change existing data.
TYPE	RDB	Route Data Block.
CUST	xx	Customer number, as already defined in LD 15. xx = 0-99 for Options 51C-81C. xx = 0-31 for Option 11C.
ROUT	0 - 511 0-127	Route Number for Options 51C-81C. Route Number for Option 11C.
TKTP	CBCT	Trunk type is NI-2 Call By Call.
...		
DTRK	YES	Define whether or not the trunk route is digital. Enter YES for digital.
- DGTP	PRI	For digital trunks, enter PRI as the digital trunk type. This prompt appears only if DTRK = YES.
...		
ISDN	YES	Integrated Services Digital Network option.
- MODE	PRA	Mode of operation is Primary Rate Access.
- IFC	NI2	Interface type is NI-2.
- IPUB	0-511 0-127	Service route to be used for incoming network calls, for Options 51C-81C. For Option 11C.

...		
ICOG	aaa	Incoming or outgoing trunk type, where aaa can be: ICT = Incoming only. OGT = Outgoing only. IAO = Both incoming and outgoing.
...		

LD 14 - Define the trunk type as NI-2 CBC, and the route member number.

Prompt	Response	Description
REQ	NEW xxx	Add new data. Follow NEW with xxx = 1-510, to create that number of consecutive trunks.
TYPE	CBCT	NI-2 Call By Call trunk type.
TN	l s c u	TN address, for Options51C-81C, where: l = loop s= shelf c = card u = unit.
	c u	Card and unit, for Option 11C, where: c = card u = unit.
...	l ch	Loop and channel for digital trunks, for Options 51C-81C, where: l = loop ch = channel.
	c ch	Card and channel for digital trunks, for Option 11C. c = card ch = channel.
...		
CUST	xx	Customer number, as already defined in LD 15. xx = 0-99 for Options 51C-81C xx = 0-31 for Option 11C.
...		
RTMB	0-511 1-510 0-127 1-510	Route number and member number, for Options 51C-81C. For Option 11C.
...		

LD 16 - Define the maximum number of channels per NI-2 service route.

Prompt	Response	Description
REQ	NEW CHG	Add a new data. Change existing data.
TYPE	RDB	Route Data Block.
CUST	xx	Customer number, as already defined in LD 15. xx = 0-99 for Options 51C-81C. xx = 0-31 for Option 11C.
ROUT	0 - 511 0-127	Route Number for Options 51C-81C. Route Number for Option 11C.
TKTP		CBCT service route trunk type.
	COT TIE DID FEX WAT	Central Office. TIE Direct Inward Dial. Foreign Exchange. Wide Area Telecommunications Service.
...		
ISDN	YES	ISDN route.
- IFC	NI2	Interface type is NI-2.
- CBCR	YES	NI-2 Cal By Call Service route indicator.
- - RTN	0-511 0-127	Master route number, as previously defined, for Options 51C-81C. For Option 11C.
- - SRVC	(0)-31	Decimal value identifying the type of service provisioned for the NI-2 service route.
...		
- - MAX	0-510	Maximum number of channels allowed on an CBCT service route.
...		

Feature operation

No specific operating procedures are required to use this feature.

Advice of Charge

Contents

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Reference list

The following are the references in this section:

- *Features and Services* (553-3001-306)

Feature Description

This section describes the Advice of Charge feature as it applies to the interface types supported by ISDN PRI.

Introduction

Prior to the introduction of the Advice of Charge supplementary service, the cost of calls to Central Offices in most European markets was calculated by counting and recording the periodic pulses provided by the Central Office during a call, and then calculating the cost of each call. The collection and storage of these charging pulses from the Central Office is referred to as Periodic Pulse Metering (PPM).

However, with the deployment of ISDN PRI in certain European public exchanges, PPM is no longer offered in its traditional form. Metering of calls for these interfaces is offered through the supplementary service called Advice of Charge (AOC)

Depending on the Central Office interface, AOC may be offered:

- at the end of a call;
- during a call; **or**
- at call set-up, during a call, and at the end of call.

AOC is summarized below for the following connectivities:

- AXE-10 Australia (at end of call)
- EuroISDN (at call set-up, during a call, end-of-call)
- INS1500 (Japan D70) (at end of call)
- Numeris (at end of call)
- Numeris (during a call)
- SwissNet (during a call)
- 1TR6 (at end of call)

Storing charging information

Charging information is stored using meters, which may be assigned to sets, attendant consoles, trunk routes, and customers as follows:

- one meter is assigned to each set, via Metered Assigned (MRA) Class of Service, on a TN basis. The charge unit count is stored in the meter of the station TN from which the call is made;
- one meter, classified as “ATTN”, is provided to collect charges for all metered calls made by attendant consoles within the same customer;
- one meter, classified as “ROUTE”, is provided for each route;
- at each node, one meter classified as “CUST” is provided for each customer to accumulate any charges that cannot be charged to any other meter for the customer.
- one temporary meter, classified as TRK, is provided for each trunk; this temporary meter is used to accumulate charges for each call. At the end of the call, the charge is added to the permanent meter associated with the caller.

  Note: The same station meters are used to store charging units for PPM and AOC. To handle a possible difference in unit costs between PPM and AOC, charge units received for an AOC metered call may be converted into internal charge units using a “Route Unit Conversion Factor” (RUCF) configured in Overlay 16.

The charging information may also be recorded in the Call Detail Recording (CDR) record, as provided by the CDR Enhancement capability (for more information on the CDR Enhancement, refer to *Features and Services* (553-3001-306)). This information is printed at the end of call, and appears in the same location of the CDR ticket as the PPM call charge information would appear, immediately following the PPM counts.

Reading and changing meters

Meters of Multiple Appearance DNs (MADNs) can be changed using the SET METER DN or SET METER TN command at a Background Terminal TTY, or using the MTR key on a Meridian 1 telephone. To change only one of the meters in a MAPDN group, only the Background Terminal TTY can be used. For Automatic Call Distribution (ACD) stations, the meters can only be changed using the POSN-ID prompt at the TTY.

Displaying charging information

Charging information may be displayed on display-equipped Meridian Modular terminals, M2317, and M3000 sets. This display capability is provided by the Charge Display at End of Call feature. This feature appends the charge information to existing information on the display and retains the information displayed for 10 seconds. Depending on the CO interface, the information may be displayed at call set-up, during a call, and/or at end of a call (for more information on the Charge Display at End of Call feature, refer to *Features and Services* (553-3001-306)).

Printing charging information

The charging information may be printed on a Background Terminal TTY.

Printing charging information on the TTY

Groups of consecutive DNs or a group of TNs can be printed, as well as all meters assigned to a Tenant or Tenants. To print only the sum of all meters, if a range of meters are selected, the option SUM is entered at the TTY. If the Hotel/Motel option is not selected, then the ROOM and ADMN prompts are suppressed in the printout.

For Multiple Appearance PDNs (MADNs), only the sum of all appearances is printed.

For Automatic Call Distribution (ACD) stations, the meters can only be printed using the POSN-ID prompt. The keyword ACD is shown in the meter count printout.

The contents of terminal meters can be automatically or manually printed. Automatic printing is done by establishing a daily, weekly, or monthly schedule. The call charge units in each terminal meter are printed on the TTY according to the schedule. With automatic printing, the terminal meters may be cleared after printing.

Manual printing allows a customer to request the printing of the contents of any meter or block or meters, as required. After printing, the meters may be cleared on command (it is not done automatically, as in automatic printing).

Handling overflow charging information

The charging information meters can store a maximum of 32,767 Periodic Pulse units. If this total is exceeded, an overflow counter is incremented. Whenever this counter reaches three, a message is output to the background terminal and the counter is reset to zero.

The charge field of the CDR record has a maximum value of 32767. If this value is overflown, a charge overflow indication (“CHXOVF”) is printed in place of the charge count field.

Note: When the meter overflows, the meter can still have stored charge information equal to less than the maximum. Therefore, it may sometimes appear to a user that the charge is small for the length of time spent on the telephone. Therefore, it is important to have a background terminal in order not lose all of the charge information related to a call. To get the total charge for a call, it may be necessary to add the information in the CDR record to the background terminal overflow message(s).

Operating parameters

The following operating parameters apply to the Advice of Charge service, for the AXE-10 Australia, INS1500 (Japan D70), Numeris, SwissNet, EuroISDN, and 1TR6 Central Office interfaces.

- There are limitations with respect to the size of the charge that can be displayed in either the CDR record or on the set display. In addition, currency symbols and decimal places cannot be displayed on sets or CDR records.
- Central Offices can send the charge with an accuracy of up to one decimal place. Smaller amounts are rounded up to the nearest integer, and thus rounding errors may have a minor affect on charging accuracy.

- The Advice of Charge information is not transported between a Meridian 1 to Meridian 1 connection. Therefore, if a tandem call is made from one Meridian 1 PBX to another Meridian 1 PBX, and then to a Central Office, the originator's display is not updated with the charge information. However, the charge is printed in the CDR record at the switch that made the connection to the Central Office.
- Charging information received on incoming calls, as may happen for reverse charging, is not supported. The existing error indication is given if an incoming call is received. This does not happen in Australia because the AOC information must be requested for each call and the Meridian 1 does not support requesting AOC information for incoming calls.

Feature interactions

The following feature interactions apply to the Advice of Charge service, for the AXE-10 Australia, INS1500 (Japan D70), Numeris, SwissNet, EuroISDN, and 1TR6 Central Office interfaces.

Attendant Calls

If the attendant originates an external call using an ISDN CO trunk providing AOC, the call charging information received from the network will be saved in the trunk's temporary meter at the end of the call. The contents of the temporary meter will be added to the contents of the attendant meter for the customer.

If the attendant is the last controlling party (i.e., does not release the call), who gets charged depends on who initiated the call. If the attendant made the call with a party on the source, it is the source who gets charged. If the attendant made the chargeable call and then dialed an internal party (station or TIE trunk) on the destination side of the loop without releasing, the attendant gets charged.

Attendant operation of metered calls

If an attendant desires billing information immediately upon the completion of a long distance call, this call can be flagged as a metered call. When a metered call is terminated, the attendant is recalled and the calculated charge for this call is displayed on the console.

The attendant activates this feature by requesting the call charge on any outgoing ISDN CO trunk providing AOC by pressing the METER (MTR) key after making the call. When the MTR key is pressed, the METER lamp is lit and all metered outgoing ISDN calls connected to the active console loop are marked as “metered”. Additional ISDN CO trunks added to the conference are also marked as “metered” automatically.

When a “metered” call is disconnected, a meter recall is presented to the same attendant who originated the call. If that attendant is in position busy, the meter recall is presented to the next idle attendant console in the same node (whether or not it is equipped with a meter key). If all attendants are in Night Service or position busy, the recall is saved in the attendant queue until one of the attendants in the same node becomes idle.

In the case of a station being extended to a toll call originated by the attendant, and if the station recalls to the attendant with the toll call attached, and the attendant accepts the call and releases the station, then the attendant is the last controlling party. The charge goes to the attendant meter.

Automatic Call Distribution

Since ACD calls are incoming only, AOC cannot apply to them; if a reverse charge is sent, it is rejected. Personal calls made by an agent are metered.

Barge-in /Busy Verification

When either of these features is operated a conference is established. If the trunk party disconnects first, the charge information is received and assigned to the originator of the call. If the originator of the call disconnects first, the charge information is received and assigned to the attendant when the trunk party releases.

Break-in

When this feature is operated a conference is established. The “desired” party can either disconnect and be rerung or the party on the trunk connection initiates the disconnection. In either case, the charge information is received and charged to the originator of the call (the “desired” party).

BRI Terminal

The AOC feature does not support AOC being sent to BRI terminals. A meter can be assigned to a Digital Subscriber Link (DSL). All chargeable calls made by a BRI terminal attached to this DSL are charged against the DSL’s meter.

BRI Trunk Access for Japan

AOC information can be received over ISDN BRI trunks using the Japan D70 signaling.

Call Forward All Calls, Call Forward Busy, Call Forward No Answer

Chargeable calls transferred to a station and redirected to another station via Call Forward are charged against: the "Call Forwarded to Station", if it answers and the transferring party completes the transfer; or the transferring party if the call is abandoned or the transfer is not completed.

Call Park

When a station user parks an AOC trunk call, the calling party will continue to be assigned the charge until the call is answered by another station user.

Call Pickup

Chargeable calls which are extended to a station and answered at another station via Call Pickup are charged against: the "Pick up Station", if the "Transferring Station" completes the call; or the transferring party if the transfer is not completed.

Call Transfer

If a station transfers a call to another internal station, while the dialed station is still ringing, the call charging information is assigned to the transferring station until the call is answered or abandoned by the external party. When the call is answered, call charging information received is stored against the station to which the call is transferred. If the station user consults with the dialed station user by using the transfer feature, the call charging information is still assigned to the transferring party until the call is actually transferred to the consultation party.

Call Waiting

If a call is transferred to a busy station with "Call Waiting Allowed", the transferring station will be charged until the call is answered.

Conference

Whenever an ISDN CO trunk providing AOC is added into a conference, the charge for the call continues to be assigned to the station user who initiated the conference. If the person who adds the call to the conference disconnects while the conference is ongoing, the DN to be charged is changed to the one that has been in the conference the longest. Since this feature only provides charge information at the end of the call, the originator of the call who drops out will not incur any charge.

Consultation

If a consultation call is established over a CO trunk providing AOC, the call is charged to the station to which the call is transferred.

Data Calls

Meters can be assigned to data terminals and a terminal can be charged for the call, but the information cannot be displayed on the terminal side because the data terminal does not have its own display.

Hospital Management

AOC information is used in the “Paid Calls Restriction” subfeature of Hospital Management. This is not fully supported as the charge appears at the end of the call. The person with the paid call restriction may actually talk longer than allowed without any indication, since the charge is not known until the call is finished.

Hunting

Chargeable calls transferred or extended to a station and redirected to another station via Hunting are charged against: the “Hunted to Station”, if the “Hunted to Station” answers and the transferring party completes the transfer; or the transferring party if the call is abandoned or the transfer is not completed.

In-band Tones and Announcements

In some ISDN cases, In-band Tones or Announcements are required. In these cases, the disconnect sequence is delayed to allow the user to hear the tones or announcements. The charge information is not displayed, printed in the CDR record or added to the permanent meter of the set until the timer expires or the user releases the call.

Malicious Call Trace (Enhanced)

In Australia, the ISDN version of this feature introduces a disconnect delay to sets with MCT class of service. This delay may be up to 30 seconds. In cases of sets having MCT class of service, the charge information is not delayed, printed in the CDR records, or added to the permanent meter of the set until the delay timer expires or the user releases the call.

Meridian Mail

The same interaction applies as for Call Transfer.

Message Registration

Due to the change in the packaging for MR/PPM, anyone using MR must ensure that the prompt in LD 17 is set to MR before setting up the associated data. This is the default.

Multiple Appearance DN

Calls made on a multiple appearance DN are charged to the MADN if there is only one MADN. If there is more than one MADN, the charge is assigned to the MADN that was configured last. This operation is the same as in the PPM/MR feature. In order to identify which prime DN the CDR record is referring to, the Auxiliary ID (AXID) must be set to “Yes” in the CDB. This enables the TN to be printed in the CDR record.

Multiple Party Operation

The same interaction applies as for Call Transfer.

Network Call Transfer

Advice of Charge is not supported for Network Call Transfers.

Periodic Pulse Metering (PPM)

The following PPM capabilities and treatments are supported by AOC:

- Multiple Appearance DN
- Attendant Recall
- Automatic Call Distribution
- Barge-in
- Break-in

- Busy Verification
- Recording the accumulated call charging information for each call on the CDR record (if CDR is equipped)
- Calculating the total charge for each call, based on the assigned unit cost and the accumulated call charging information
- Allowing the attendant to mark a call as being metered, and to display the charge for the call, and
- Allowing a Meridian 1 telephone set equipped with an MRK key and digit display to access meters.

Radio Paging

In the case of party "A" making a toll call and then attempting to transfer or conference in a user who is forwarded to a pager, party "A" is charged. If the paged party answers the call, the charge is assigned to the station where the call is picked up.

Recovery of Misoperation of Call Transfer

In the case of the call being forwarded to the attendant after misoperation and being answered by the attendant, the charge is assigned to the attendant's meter. All the other misoperation options are handled as described in the Call Transfer section.

Advice of Charge for Central Office Connectivity

The following sections describe the AOC capability as applied to AXE-10 Australia, INS1500 (Japan D70), Numeris, SwissNet, EuroISDN, and 1TR6 connectivities.

AXE-10 Australia (end of call)

This capability provides AOC call charging information sent from an AXE-10 Australia CO to a Meridian 1 PBX over an ISDN PRI connection. Information is received, displayed, and recorded in the CDR when the call is taken down.

AOC for Australia AXE-10 supports PBX control of AOC, which means that the call charging information must be requested for each outgoing call (instead of expecting it for every call once AOC has been configured).

Feature packaging

The following packages are required for Advice of Charge:

- Call Detail Recording (CDR) package 4;
- Call Detail Recording Teletype Terminal (CTY) package 5;
- Controlled Class of Service (CCOS) package 81;
- Background Terminal (BGD) package 99;
- Periodic Pulse Metering/Message Registration (MR) package 101;
- Integrated Services Digital Network (ISDN) package 145;
- 2.0 Mb Primary Rate Interface (PRI2) package 154; and
- International Primary Rate Access (IPRA) package 202.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 17 – Select PPM functionality and CDR format.

2 LD 15 – Allow CDR Charge.

3 LD 15 – Allow Charge Display.

4 LD 16 – Allow AOC on the route.

5 LD 10/11– Assign meters to sets.

6 LD 12 – Assign a Meter Recall key to the Attendant Console.

The following steps assume an ISDN Interface has already been set up.

LD 17 – Select PPM functionality and CDR format.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	CFN	Configuration record.
...		

PARM	YES	System parameters.
MTRO	PPM	Periodic Pulse Metering.

LD 15 – Allow CDR Charge.

Prompt	Response	Description
REQ:	CHG	Change.
TYPE:	PPM	Periodic Pulse Metering.
CUST	xx	Customer number.
...		
- UCST	x	Unit cost, x = (0)-9999.

LD 15 – Allow Charge Display.

Prompt	Response	Description
REQ:	CHG	Change.
TYPE:	FTR	Customer features and options.
CUST	xx	Customer number.
...		
OPT	CHDA	Charge display allowed.
...		

LD 16 – Allow AOC on the route.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	RDB	Route data block.

...		
ISDN	YES	Configure ISDN data.
IFC	AXEA	ISDN Interface for Australia. Must be configured in LD 17 for the applicable D-channel.
...		
CDR	YES	Call Detail Recording.
...		
OTL	YES	CDR on outgoing toll calls.
...		
OAN	YES	CDR on all answered outgoing calls.
...		
MR	ENDC	AOC End of Call allowed for international ISDN interfaces.
RUCS	1	Route unit cost value received is treated as charge.
RUCF	1 0	Route unit conversion factor, no conversion required.

LD 10/11– Assign meters to sets.

Prompt	**Response**	**Description**
REQ:	NEW CHG	Add new data. Change existing data.
TYPE:	aaaa	Telephone type where aaaa = 500,2500, SL1, 2006, 2008, 2009, 2016, 2018, 2112, 2216, 2317, 2616, or 3000.
TN	l s c u	Terminal Number, for Options 51C, 61C, 81C.
	c u	For Option 11C.
...		
CLS	MRA	Message Registration Allowed.

LD 12 – Assign a Meter Recall key to the Attendant Console.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	aaaa	Type of console, where aaaa = 1250 for M1250 console, 2250 for M2250 console, ATT for QCW3, QCW4 console, or PWR if the TN is used for power or Attendant Supervisory Module ASM.
TN	l s c u	Terminal Number, for Options 51C, 61C, 81C.
	c u	For Option 11C.
...		
KEY	xx MTR	Assign a Meter recall key on the attendant console.

EuroISDN (call set-up, during call, end of call)

This feature provides the Advice of Charge supplementary service for ISDN PRI to Public Exchanges/Central Offices complying with the European Telecom Standard Institute (ETSI) standard specification ETS 300 102. This standard is also known as EuroISDN.

AOC for EuroISDN offers three subservices, which may be configured in Overlay 16 (information at call setup – AOC-S; during the call – AOC-D; and at the end of the call – AOC-E).

Operating parameters

The countries AOC supports on EuroISDN are Austria, Germany, Norway, Italy, Switzerland, Finland, Holland, and Portugal.

Requesting the AOC supplementary service on a per call basis is not supported by this development.

Feature packaging

The following packages are required for Advice of Charge:

- EuroISDN (EURO) package 261.

- Call Detail Recording (CDR) package 4;
- Call Detail Recording Teletype Terminal (CTY) package 5;
- Controlled Class of Service (CCOS) package 81;
- Background Terminal (BGD) package 99;
- Periodic Pulse Metering/Message Registration (MR) package 101; and
- International Supplementary Features (SUPP) package 131.

For PRI connectivity, the following features are also required:

- Integrated Services Digital Network (ISDN) package 145;
- 2.0 Mb Primary Rate Access (PRI2) package 154;
- ISDN Supplementary Features (ISDNS) package 161; and
- International Primary Rate Access (IPRA) package 202.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 15 – Allow CDR Charge.

2 LD 15 – Allow Charge Display.

3 LD 16 – Allow AOC on the route.

4 LD 10/11 – Assign meters to sets.

5 LD 12 – Assign a Meter Recall key to the Attendant Console.

The following steps assume an ISDN interface is already set up.

LD 17 – The following steps assume an ISDN interface is already set up.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	ADAN	Change I/O devices.
- ADAN	CHG DCH XX	Change D-channel, xx = 0-15.

...		
- IFC	EURO	EuroISDN interface.
- CNTY		Enter country pertaining to EuroISDN interface.
	AUS	Austria
	DEN	Denmark
	(ETSI)	ETS 300-102 basic protocol
	FIN	Finland
	GER	Germany
	ITA	Italy
	NOR	Norway
	POR	Portugal
	SWE	Sweden
	EIR	Ireland
	DUT	Holland
	SWI	Switzerland
	BEL	Belgium
	ESP	Spain
	UK	United Kingdom
	FRA	France
	CIS	Commonwealth of Independent States (Russia and the Ukraine).

LD 15 – Allow CDR Charge.

Prompt	**Response**	**Description**
REQ:	CHG	Change.
TYPE:	PPM	Periodic Pulse Metering.
CUST	xx	Customer number.
...		
- UCST	x	Unit cost, x = (0)-9999.

LD 15 – Allow Charge Display.

Prompt	Response	Description
REQ:	CHG	Change.
TYPE:	FTR	Customer features and options.
CUST	xx	Customer number.
...		
OPT	CHDA	Charge display allowed.
...		

LD 16 – Allow AOC on the route.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	RDB	Route data block.
CUST	xx	Customer number.
ROUT	xx	Route number.
...		
ISDN	YES	Configure ISDN data.
...	...	Other ISDN sub-prompts.
-IFC	EURO	EuroISDN interface.

- - CNTY		Enter country pertaining to EuroISDN interface.
	AUS	Austria
	DEN	Denmark
	(ETSI)	ETS 300-102 basic protocol
	FIN	Finland
	GER	Germany
	ITA	Italy
	NOR	Norway
	POR	Portugal
	SWE	Sweden
	EIR	Ireland
	DUT	Holland
	SWI	Switzerland
	BEL	Belgium
	ESP	Spain
	UK	United Kingdom
	FRA	France
	CIS	Commonwealth of Independent States (Russia and the Ukraine).
...		
MR	(NO)	No AOC service.
	ENDC	AOC-E subservice activated.
	DURC	AOC-D subservice activated.
	STAC	AOC-S subservice activated. Not printed for Denmark and Sweden.
RUCS	0-9999	Route unit cost. Not printed for Denmark and Sweden
RURC	0-9999 (0)-3	Route unit reference cost. Note that the formula for the route unit reference cost is: $X*10^{(-Y)}$, where X=0-9999, and Y=0-3. The default value for X is identical to the previously entered RUCS value. Not printed for Denmark and Sweden.
RUCF	0-(1)-9999 (0)-3	Route unit conversion factor. Note that the formula for the route unit reference cost is: $X*10^{(-Y)}$,where X=0-9999, and Y=0-3. The default value for X is identical to the previously entered RUCS value. Not printed for Denmark and Sweden.

LD 10/11 – Assign meters to sets.

Prompt	Response	Description
REQ:	NEW CHG	Add new data. Change existing data.
TYPE:	aaaa	Telephone type where aaaa = 500, 2500, SL1, 2006, 2008, 2009, 2016, 2018, 2112, 2216, 2317, 2616, or 3000.
TN	l s c u	Terminal Number, for Options 51C, 61C, 81C.
	c u	For Option 11C.
CLS	MRA	Message Registration allowed.

LD 12 – Assign a Meter Recall key to the Attendant Console.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	aaaa	Type of console, where aaaa = 1250 for M1250 console, 2250 for M2250 console, ATT for QCW3, QCW4 console, or PWR if the TN is used for power or Attendant Supervisory Module ASM.
TN	l s c u	Terminal Number.
	c u	For Option 11C.
...		
KEY	xx MTR	Assign a Meter recall key on the attendant console.

INS1500 (Japan D70) (end of call)

This capability provides AOC call charging information sent from an INS1500 (Japan D70) CO to a Meridian 1 PBX over an ISDN PRI connection. Information is received, displayed, and recorded in the CDR when the call is taken down.

Prior to the introduction of the AOC feature for Japan D70, the method used to determine which feature was equipped was to check if the International Supplementary Features software package 131 was equipped. If it was, PPM was required. Since the Supplementary Features package is not available in Japan and AOC requires PPM software, a new method of determination has been introduced.This method uses a system-wide flag to allow the customer to select between MR and PPM. This flag is set by a prompt in LD 17.

Special handling for call charges that exceed normal capacity

The largest charge that can be accepted from the Public Switched Telephone Network (PSTN) is 3,999,999,999. In Japan, however, the largest possible charge is 99,999,999,999 Yen. The Meridian 1 system algorithm for processing the call charge has been set up so that if a number larger than 3,999,999,999 is received by the system, the number is stored as 4,000,000,000 and handled as any smaller number; the rest of the charge is dropped (it is highly unlikely that a charge of this value will ever be encountered).

Feature packaging

The following packages are required for Advice of Charge:

- Call Detail Recording (CDR) package 4;
- Call Detail Recording Teletype Terminal (CTY) package 5;
- 1.5 Mb Digital Trunk Interface (PBXI) package 75;
- Controlled Class of Service (CCOS) package 81;
- Background Terminal (BGD) package 99;
- Periodic Pulse Metering/Message Registration (MR) package 101;
- Integrated Services Digital Network (ISDN) package 145;
- 1.5 Mb Primary Rate Access (PRA) package 146; and
- International Primary Rate Access (IPRA) package 202.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 17 – Select PPM functionality and CDR format.

2 LD 15 – Allow CDR Charge.

3 LD 15 – Allow Charge Display.

4 LD 16 – Allow AOC on the route..

5 LD 10/11– Assign meters to sets.

6 LD 12 – Assign a Meter Recall key to the Attendant Console.

The following steps assume an ISDN Interface has already been set up.

LD 17 – Select PPM functionality and CDR format.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	CFN	Configuration record.
PARM	YES	Parameters for Interface and transmission mode.
...		
FCDR	NEW	Use New CDR format (recommended for Japan).
...		
MTRO	PPM	Periodic Pulse Metering.

LD 15 – Allow CDR Charge.

Prompt	Response	Description
REQ:	CHG	Change.
TYPE:	PPM	Periodic Pulse Metering.

CUST	xx	Customer number.
...		
- UCST	x	Unit cost, x = (0)-9999.

LD 15 – Allow Charge Display.

Prompt	Response	Description
REQ:	CHG	Change.
TYPE:	FTR	Customer features and options.
CUST	xx	Customer number.
...		
OPT	CHDA	Charge display allowed.
...		

LD 16 – Allow AOC on the route.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	RDB	Route data block.
...		
ISDN	YES	Configure ISDN data.

IFC	D70	ISDN Interface for Japan.
...		
CDR	YES	Call Detail Recording.
...		
OTL	YES	CDR on outgoing toll calls.
...		
OAN	YES	CDR on all answered outgoing calls.
...		
MR	ENDC	AOC End of Call allowed for international ISDN interfaces.
RUCS	1	Route unit cost value received is treated as charge.
RUCF	1 0	Route unit conversion factor, no conversion required.

LD 10/11– Assign meters to sets.

Prompt	Response	Description
REQ:	NEW CHG	Add new data. Change existing data.
TYPE:	aaaa	Telephone type where aaaa = 500, 2500, SL1, 2006, 2008, 2009, 2016, 2018, 2112, 2216, 2317, 2616, or 3000.
TN	l s c u	Terminal Number, for Options 51C, 61C, 81C.
	c u	For Option 11C.
...		
CLS	MRA	Message Registration Allowed.

LD 12 – Assign a Meter Recall key to the Attendant Console.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	aaaa	Type of console, where aaaa = 1250 for M1250 console, 2250 for M2250 console, ATT for QCW3, QCW4 console, or PWR if the TN is used for power or Attendant Supervisory Module ASM.
TN	l s c u	Terminal Number, for Options 51C, 61C, 81C.
	c u	For Option 11C.
...		
KEY	xx MTR	Assign a Meter recall key on the Attendant Console.

Numeris (end of call)

This capability provides AOC call charging information sent from a Numeris CO to a Meridian 1 PBX over an ISDN PRI connection. Information is received, displayed, and recorded in the CDR when the call is taken down.

Feature packaging

The following packages are required for Advice of Charge:

- Integrated Services Digital Network (ISDN) package 145;
- 2.0 Mb Primary Rate Access (PRI2) package 154; and
- International Primary Rate Access (IPRA) package 202.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 17– Change Configuration Record to allow PPM.

2 LD 12 – Assign a Meter recall key on the Attendant Console.

3 LD 15 – Configure the Customer Data Block for AOC.

4 LD 15 – Configure Periodic Pulse Metering.

5 LD 16 – Modify the Trunk Route for AOC.

LD 17– Change Configuration Record to allow PPM.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	CFN	Configuration record.
PARM	YES	Parameters for Interface and transmission mode.
...		
MTRO	PPM	Periodic Pulse Metering.

LD 12 – Assign a Meter recall key on the Attendant Console.

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	aaaa	Type of console, where aaaa = 1250 for M1250 console, 2250 for M2250 console, ATT for QCW3, QCW4 console, or PWR if the TN is used for power or Attendant Supervisory Module ASM.
TN	l s c u	Terminal number.
	c u	For Option 11C.
...		
KEY	xx MTR	key number, Meter key.

LD 15 – Configure the Customer Data Block for AOC.

Prompt	Response	Description
REQ:	CHG	Change existing data.
TYPE:	FTR	Features and options.
CUST	xx	Customer number.
...		
ICI	xx MTR	ICI number, Meter Recall.

LD 15 – Configure Periodic Pulse Metering.

Prompt	Response	Description
REQ:	CHG	Change.
TYPE:	PPM	Periodic Pulse Metering.
CUST	xx	Customer number.
HMTL	(YES) NO	Hotel/Motel environment.
PCDL	YES	PPM output on CDR Link. Additional three words added to tape record.
UCST	x	Unit cost for Periodic Pulse Metering, x=(0)-9999.
ATCH	(NO) YES	Attendant display of call charge.

LD 16 – Modify the Trunk Route for AOC.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	aaaa	Type of data block.
CUST	xx	Customer number.

...		
OAL	YES	CDR on Outgoing calls.
- OTL	YES	CDR on Outgoing toll calls.
...		
CCO	YES	Printing CDR records for no PPM or AOC count.
...		
MR	ENDC	The AOC information is decoded at the end of the call.
...		
RUCF	x y	Route Unit Conversion Factor.

Numeris and SwissNet (during call)

Advice of Charge (AOC) Real Time is provided through this feature as part of the connectivity between the Meridian 1 and both Numeris for France and SwissNet for Switzerland.

Each country offers the AOC service in a specific manner. For Numeris Connectivity for France, and SwissNet Connectivity for Switzerland, AOC service is configured on an ISDN Route basis, and provides the total cost of the call at call tear down. This information can be displayed on the user's set, as well as stored in Call Detail Recording (CDR) records. Advice of Charge (AOC) Real Time supplementary service uses cumulative charging information during a call to provide "real-time" updates of the charging information. To do this, the feature uses the same meters as PPM and follows specifications defined in the PPM feature.

Advice of Charge is provided as follows:

- for a simple call, the total cost for the call is produced in the CDR record

- for a call which has been modified by transfer or conference, the cost of each part of the call is provided in each CDR record associated with each extension, and
- a call is redirected, the CDR records show all extensions associated with a particular call together with the call costs associated with each extension.

Operating parameters

The display of call charge during the call is not supported, but the display of call charge at the end of the call is provided by the feature.

For Numeris, a user must be subscribed to the AOC supplementary service in order to get the charging information sent to the Meridian 1.

For SwissNet both services are given by the Swiss PTT without previous subscription.

Feature packaging

The following packages are required for Advice of Charge:

- Periodic Pulse Metering/Message Registration (MR) package 101.
- For PRI connectivity, the following packages are required:
- Integrated Services Digital Network (ISDN) package 145;
- 2.0 Mb Primary Rate Access (PRI2) package 154;
- International Primary Rate Access (IPRA) package 202; and
- ISDN Supplementary Features (ISDNS) package 161.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 17 – Select PPM functionality and CDR format.

2 LD 15 – Allow CDR Charge.

3 LD 15 – Allow Charge Display.

4 LD 16 – Allow AOC on the route.

5 LD 10/11 – Assign meters to sets.

6 LD 12 – Assign a Meter Recall key to the Attendant Console.

LD 17 – Select PPM functionality and CDR format.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	CFN	Configuration record.
PARM	YES	Parameters for Interface and transmission mode.
...		
MTRO	PPM	Periodic Pulse Metering.

LD 15 – Allow CDR Charge.

Prompt	Response	Description
REQ:	CHG	Change.
TYPE:	PPM	Periodic Pulse Metering.
CUST	xx	Customer number.
...		
- UCST	x	Unit cost, x = (0)-9999.

LD 15 – Allow Charge Display.

Prompt	Response	Description
REQ:	CHG	Change.
TYPE:	FTR	Customer features and options.
CUST	xx	Customer number.
...		

OPT ...	CHDA	Charge display allowed.

LD 16 – Allow AOC on the route.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	RDB	Route data block.
CUST	xx	Customer number.
ROUT	xx	Route number.
...		
ISDN	YES	Configure ISDN data.
IFC	NUME SWIS	ISDN Interface for Numeris (France). ISDN Interface for Swis (Switzerland).
CDR	YES	Call Detail Recording.
OTL	YES	CDR on outgoing toll calls.
OAN	YES	CDR on all answered outgoing calls.
MR	DURC	AOC during a call.
CCO	TES	Disable the printing of CDR N records.
RUCS	1	Route unit cost value received is treated as charge.
RUCF	1 0	Route unit conversion factor, no conversion required.

LD 10/11 – Assign meters to sets.

Prompt	Response	Description
REQ:	NEW CHG	Add new data. Change existing data.

TYPE:	aaaa	Telephone type where aaaa = 500, SL1, 2006, 2008, 2009, 2016, 2018, 2112, 2216, 2317, 2616, or 3000.
TN	l s c u	Terminal Number.
	c u	For Option 11C.
...		
CLS	MRA	Message Registration Allowed.

LD 12 – Assign a Meter Recall key to the Attendant Console.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	aaaa	Type of console, where aaaa = 1250 for M1250 console, 2250 for M2250 console, ATT for QCW3, QCW4 console, or PWR if the TN is used for power or Attendant Supervisory Module ASM.
TN	l s c u	Terminal Number, for Options 51C, 61C, 81C.
	c u	For Option 11C.
...		
KEY	xx MTR	Assign a Meter recall key on the attendant console.

1TR6 (end of call)

This capability provides AOC call charging information sent from a 1TR6 CO to a Meridian 1 PBX over an ISDN PRI connection. Information is received, displayed, and recorded in the CDR when the call is taken down.

Feature packaging

The following packages are required for Advice of Charge:

- Periodic Pulse Metering/Message Registration (MR) package 101.

For PRI connectivity, the following packages are required:

- Integrated Service Digital Network (ISDN) package 145;
- 2.0 Mb Primary Rate Interface (PRI2) package 154;
- ISDN Supplementary Features (ISDNS) package 161; and
- International Primary Rate Access (IPRA) package 202.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 12 – Assign a Meter recall key on the Attendant Console.

2 LD 15 – Configure the Customer Data Block for AOC.

3 LD 15 – For nodes with 1TR6 connections, configure call charging.

4 LD 15 – For nodes with 1TR6 connections, configure charge recording.

5 LD 17 – Change LD 17 to allow for AOC.

6 LD 16 – Change the Trunk Route for AOC.

7 LD 16 – For nodes with 1TR6 connections configuring call-charge metering and printing.

LD 12 – Assign a Meter recall key on the Attendant Console.

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	ATT	QCW3 or QCW4 Attendant Console data block.
TN	l s c u	Terminal Number, for Options 51C, 61C, 81C.
	c u	For Option 11C.
...		
KEY	x MTR x NULL	key number, Meter key. Remove a Meter key.

LD 15 – Configure the Customer Data Block for AOC.

Prompt	Response	Description
REQ:	CHG	Change existing data.
TYPE:	NET	ISDN and ESN Networking options.
CUST	xx	Customer number.
...		
ISDN	YES	Integrated Services Digital Network allowed for customer.
...		
- PFX1	xxxx	Prefix 1.
- PFX2	xxxx	Prefix 2.

LD 15 – For nodes with 1TR6 connections, configure call charging.

Prompt	Response	Description
REQ;	CHG	Change existing data.
TYPE:	ATT	Attendant Console options.
CUST	xx	Customer number.
...		
ICI	x MTR	ICI number, Meter Recall.

LD 15 – For nodes with 1TR6 connections, configure charge recording.

Prompt	Response	Description
REQ:	CHG	Change existing data.
TYPE:	PPM	Periodic Pulse Metering.
CUST	xx	Customer number.

HMTL	(YES) NO	Hotel/Motel environment.
PCDL	YES	PPM output on CDR Link. Additional three words added to tape record.
UCST	(0) - 9999	Unit Cost for Periodic Pulse Metering.
ATCH	(NO) YES	Attendant display of call Charge.
SCDL	 (0) 1 2 3	Schedule for printing Message Registration and PPM data. No scheduled printing. Daily printout. Weekly printout. Monthly printout.
- WKDY	1-7	Week Day for weekly printout. Where 1 = Sunday.
- DAY	0-28	Day of month for printout.
- HOUR	hh or hh hh	Hour of day for printout.
- MCLR	(NO) YES	Meter Clear after printing.
- PTTY	(0)-15	PPM TTY number for printing meters, one per switch.

LD 17 – Change LD 17 to allow for AOC.

Prompt	**Response**	**Description**
REQ	CHG	Change.
TYPE	ADAN	All input/output devices.
ADAN	CHG DCH x	Action device and number, x = 0-15.
...		
ISDN	YES	Integrated Services Digital Network.
...		
- IFC	1TR6	1 TR6 for Germany.
- CNEG	(1) 2	Channel Negotiation option.

- LAPD	YES	Link Access Protocol for D-channel. Change LAPD parameters.
- - T203	2-(10)-40	Maximum Time allowed without frames being exchanged in seconds.

LD 16 – Change the Trunk Route for AOC.

Prompt	Response	Description
REQ	NEW CHG	Ad new data. Change existing data.
TYPE	RDB	Route data block.
CUST	xx	Customer number
ROUT	xx	Route number.
...		
ISDN	YES	Integrated Services Digital Network
- IFC	1TR6	1TR6 for Germany

LD 16 – For nodes with 1TR6 connections configuring call-charge metering and printing.

Prompt	Response	Description
REQ	NEW CHG	Ad new data. Change existing data.
TYPE	RDB	Route data block.
CUST	xx	Customer number.
ROUT	xx	Route number.
...		
CDR	YES	Call Detail Recording.
- OAL	YES	CDR on outgoing calls.

- - OTL	YES	CDR on Outgoing Toll calls.
CCO	(NO) YES	
RUCS	0-9999	Route Unit Cost.

Feature operation

No specific operating procedures are required to use this feature.

Analog Semi-permanent Connections

Contents

The following are the topics in this section:

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Feature Description

The Analog Semi-permanent Connections (ASPC) feature provides the capability to automatically re-establish any disconnected ASPC call that the Meridian 1 system detects. The user configures the ASPC feature for a trunk and sets a re-connection timer defined at the customer level.

The XFEM card in a Meridian 1 system controls incoming and outgoing manual trunks. Each trunk is dedicated to a single piece of equipment. When equipment linked to an incoming trunk wants to establish a communication with equipment on an outgoing manual trunk, both trunks have to be linked in a software manner using the Manual Directory Number (MNDN) prompt. The originating equipment has to connect the E-lead of the trunk on its side to the ground. This connection is seen as a seize message on the PBX side; both trunks are then linked together. The configuration can also involve calls across intermediate TIE trunks.

If communication is broken after an ASPC call is established between two systems, the incoming trunk is left in the busy state. A message is then printed along with the date, time, manual incoming trunk TN and its corresponding MNDN on the TTY. This message indicates that the call has been disconnected. Re-connection is attempted at regular intervals based on the ASPC timer. The call is re-established once the connection is made again. The call can also be re-established when the IPE manual incoming E&M TIE trunk is disabled and enabled in Overlay 36. Another message is printed on the TTY when the call is re-established.

When the Meridian 1 system detects a disconnected ASPC call, the ASPC re-connection Timer (ASPCT) starts. When the ASPCT time expires, re-connection of the call is attempted. If the call is not established, the ASPCT time is reset and the process repeats until the call is re-established.

To enable/disable this feature, the Analog Semi-permanent Connections Allowed (SPCA) or Analog Semi-permanent Connections Denied (SPCD) Class of Service must be defined in Overlay 14 for incoming manual trunks.

Operating parameters

The ASPC feature is only applicable to IPE 2/4 E&M manual incoming trunks. It does not apply to trunks that are Incoming and Outgoing (IAO). Set up ASPC over IPE 2/4 wire E&M analog trunks with the Manual Incoming Service Allowed (MIA) Class of Service on XFEM trunk cards.

ASPC trunks must have ASPC Class of Service on each switch on which incoming manual trunks are terminating. Therefore, such switches must be C machines only. However, Omega machines can be present on any other node of the network, including tandem nodes and outgoing nodes.

If system initialization occurs during reconnection, the ASPC reconnection mechanism fails and the call is not re-established.

The incoming manual trunk, when seized at the far end, is automatically terminated on the MNDN. The manual outgoing trunk service dials the outgoing route access code to complete an outgoing call after ringing the trunk. Therefore, an incoming seizure from the manual trunk (performed as soon as one piece of equipment connects the E-lead to the ground), configured to terminate on a second piece of equipment, using the outgoing manual route access code, ends up as an established tandem connection between the two pieces of equipment.

The MNDN of the incoming trunk can provide access to a private network route, and then to another manual outgoing E&M route. In this event, the MNDN cannot be the collation of the two access codes, because of the resulting conflict between the first access code and the MNDN. One solution is to define a Trunk Steering Code with Digit Manipulation. The digits related with the MNDN are defined to give access to the private route, then deleted to be replaced by the access code of the E&M route.

Feature interactions

There are no feature interactions associated with this feature

Feature packaging

The Analog Semi-permanent Connection (ASPC) feature is included in base X11 system software.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 15 – Configure ASPC reconnection timer.

2 LD 16 – Configure Outgoing Manual Route..

3 LD 16 – Configure Incoming Manual Route.

4 LD 14 – Configure Incoming Manual Trunk.

LD 15 – Configure ASPC reconnection timer.

Prompt	Response	Description
REQ:	CHG	Change existing data.
TYPE:	FTR	Customer features and options.
CUST	xx	Customer number.
....	....	
BSFE	(NO) YES	Boss Secretary Filtering Enhancement
ASPCT	(10)–180	ASPC reconnection Timer (in seconds).

LD 16 – Configure Outgoing Manual Route.

Prompt	Response	Description
REQ	CHG	Change route data.
TYPE	RDB	Route data block.
CUST	xx	Customer number associated with this route.
....	....	
TKTP	a..a	Outgoing manual trunk type
...		
ICOG	OGT	Outgoing route.
ACOD	xxx	Access code for the trunk route.
NEDC	ETH	Near End Disconnect Control. If the far end goes on-hook for either incoming or outgoing calls, the on-hook condition is recognized and the call is disconnected.
FEDC	ETH	Far End Disconnect Control. Conditions at the near end are recognized for both incoming and outgoing calls.
MANO	YES	Manual Outgoing trunk route.

LD 16 – Configure Incoming Manual Route.

Prompt	Response	Description
REQ	CHG	Change route data.
TYPE	RDB	Route data block.
CUST	xx	Customer number associated with this route.
....	....	
TKTP	a..a	Outgoing manual trunk type
....	....	
ICOG	ICT	Incoming route.
NEDC	ETH	Near End Disconnect Control on either side.
FEDC	ETH	Far End Disconnect Control on either side.

LD 14 – Configure Incoming Manual Trunk.

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	TIE	TIE trunk data block.
TN	l s c u c u	Terminal number, for Options 51C, 61C, 81C. Option 11C format.
...		
CUST	xx	Customer number associated with this route.
....	....	
RTMB	 0-511 1-510 0-127 1-510	Route Number and Member Number. For Options 51C, 61C, 81C. Option 11C format.
...		

MNDN	xx...x	Manual Directory Number xx...x is the access code of the outgoing manual route or is the DN of the terminating set.
CLS	MIA SPCA	Manual Incoming Allowed. ASPC allowed. SPCD = ASPC denied (default).

Feature operation

No specific operating procedures are required to use this feature.

Attendant and Network Wide Remote Call Forward

Contents

The following are the topics in this section:

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Feature Description

In the past, the Remote Call Forward (RCFW) feature allowed a user to administer call forward from a remote set within the Meridian 1 or from outside the Meridian 1 through the Direct Inward System Access (DISA) number. The RCFW feature was not available on a network wide basis, nor was it applicable to Attendant Consoles. This enhancement introduces the RCFW feature across the Meridian Customer Defined Network (MCDN), while also providing the attendant with RCFW capabilities.

The feature capabilities of the set-based (FFC activated) network wide application of the RCFW feature match those of the current stand-alone RCFW feature.

The attendant RCFW functionality is controlled by a flexible Attendant key (RFW). The attendant has the capability to view the current call forward number and determine the call forward status of any station. It is also possible for an attendant to activate or deactivate call forward for a particular station. This functionality is applicable both locally within the Meridian 1 and network wide. ISDN FACILITY messages are used to facilitate the RCFW Feature operation in an MCDN.

Attendant RCFW does not require a station password to activate call forward for a station. An optional, customer-based, password can be configured for attendant operation of the RCFW feature.

Operating parameters

The network wide application of this feature is only applicable to nodes in an MCDN. No other Central Office (CO) or PBX type is supported for this Feature operation.

For set-based network operation of the Remote Call Forward feature, the Station Control Password Length (SCPL) must be configured to be the same length for all nodes in the network. Attempts to operate RCFW with different SCPLs will result in overflow tone being presented to the user.

For network operation of the RCFW feature, the Private Network Identifier (PNI) must be configured consistently for all nodes in the network.

The Attendant and Network Wide RCFW features use the existing RCFW code to activate or deactivate call forward on stations. As such, all limitations applicable to the local RCFW feature are applicable to the network and attendant operation of the feature.

As the Swedish CD Attendant Console does not support alpha characters, the "PWD" prompt is not displayed on the console's digit display when a password is required. The indication that a password is required is limited to the winking RFW key lamp.

Feature interactions

Outpulsing of Asterisk and Octothorpe (OAPO)

If the OAPO package is equipped, the "#" will be treated as any other dialed digit and will not be used to signal end of dialing. The end of dialing digits to be used are defined in LD 15.

BRI

Since ISDN BRI sets do not support Flexible Feature Codes (FCCs), Remote Call Forward is not supported on BRI sets.

Multiple Appearance DNs

The RCFW feature only applies to the primary appearances of Multiple Appearance DNs, and it is recommended that only one appearance of a Multiple Appearance DN be configured as the prime DN.

Network operation of the RCFW feature simply provides network access to the stand-alone RCFW feature, therefore the requirement that only one prime DN per Multiple Appearance DN also applies to the network-based RCFW feature.

However, with the stand-alone set-based RCFW feature, there is no code in place to explicitly prohibit the configuration of Multiple Appearance DNs with the same prime DN and Station Controlled Passwords (SCPWs) on different stations. No code is added for the network or attendant implementation of this feature. As such, in the event that multiple stations are configured with the same prime DN, the set-based network RCFW Feature operation will be the same as that for stand-alone RCFW Feature operation.

For the case of multiple stations with the same prime DN and SCPW, the RCFW operation will apply to the station that has the Multiple Appearance Redirection Prime (MARP) assigned to it.

If none of the stations having the DN and SCPW assigned are configured as the MARP TN for that DN, the RCFA and RCFD will apply to all stations matching the DN and SCPW. RCFW will apply to the station with MADN call presentation priority (i.e., the station with the last service change is placed at the end of the list).

The attendant-based RCFW feature will only apply to remote call forward operation to the prime DN with MARP status. If the DN is not the prime DN or does not have MARP status, overflow tone will be received by the user.

Call Forward Activation from any Feature/Call Forward and Busy Status

There are no direct conflicts with either of these features and the RCFW feature.

Preventing Reciprocal Call Forward

When Preventing Reciprocal Call Forward Allowed (PVCA) is defined in LD 15, a set within the same customer configuration cannot be call forwarded to a set that is call forwarded back to it. Thus, CFW loops are prevented.

This feature applies when the CFW DN is changed by Remote Call Forward. For network operation of the set- and attendant-based RCFW features, entering an invalid CFW DN (under the rules of the PRCF feature) results in overflow tone being returned and the CFW DN being ignored.

Phantom TN

A Phantom TN does not physically exist, but can be configured with limited hardware associated with it (i.e., no sets or line cards); however, all required data blocks are configured.

The Phantom TN feature allows users to configure the CFW DN of Phantom TNs to their current location. The Phantom TN feature uses the RCFW feature to configure and activate/deactivate the CFW DN on the Phantom TNs.

As the data blocks associated with Phantom TNs match those of standard PBX sets configured within the Meridian 1, the operation of the RCFA and RCFD features on Phantom TNs is applicable to the RCFW feature. As such, the set-based local and network RCFW features can be used to configure and activate/deactivate the CFW DN of Phantom TNs.

The Phantom TN feature uses a Default Call Forward (DCFW) DN. If call forward is not active on the Phantom TN, all calls to the Phantom TN DN are routed to the DCFW DN.

The Phantom TN feature modifies the set-based RCFW feature so that if CFW is not active on the Phantom TN, and the CFW DN entered in the RCFV operation matches the DCFW DN, confirmation tone is returned to the RCFV user; if the CFW DN entered does not match the CDFW DN, overflow is returned.

This change to the set-based RCFV operation is applicable to the network RCFV operation. The operation of this feature network wide requires no changes to the ISDN message passing for the set-based network RCFV operation.

There is no Attendant RCFW operation which interacts with the DCFW DN of Phantom TNs.

Traffic Measurements

The peg count, for the attendant RFW key, will be generated on the first RFW key press of the RCFW operation. While the RFW key may be pressed multiple times during a single RCFW function, the peg count will only be implemented once.

The RFW key peg count will be included in the TFC005 feature key usage traffic report.

Feature packaging

The following package is required for Attendant and Network Wide Remote Call Forward:

- The Attendant Remote Call Forward (ARFW) package 253.

For set-based RCFW, the following software packages are required:

- Optional Features (OPFT) package 1;
- Controlled Class of Service (CCOS) package 81; and
- Flexible Feature Codes (FCC) package 139.

For implementation on PBX sets, the following software packages are required:

- Special Service for 2500 Sets (SS25) package 18; and
- 500 Set Dial Access to Features (SS5) package 73.

For network operation, the following software packages are required:

- Integrated Services Digital Network (ISDN) package 145;
- Network Alternate Route Selection (NARS) package 58; and/or
- Coordinated Dialing Plan (CDP) package 59.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

Set-based Configuration:

1 LD 15 – Set the Station Control Password Length.

2 LD 15 – Configure a Special Prefix Number (SPRE) for the customer.

3 LD 15 – Map the NARS/BARS access code to the incoming call types.

4 LD 10 – Set the Station Control Password and allow Call Forward.

5 LD 11 – Set the Station Control Password and allow Call Forward.

6 LD 16 – Configure the route data block.

7 LD 57 – Define Remote Call Forward FFCs and set FFCT.

Attendant-based Configuration:

8 LD 12 – Configure the Flexible Attendant feature key, RFW.

9 LD 15 – Configure the Attendant RCFW password.

10 LD 15 – Map the NARS/BARS access code to the incoming call types.

Set-based Configuration

LD 15 – Set the Station Control Password Length.

Prompt	Response	Description
REQ:	CHG	Change.
TYPE:	FFC	Flexible Feature Codes.
CUST	xx	Customer number.
...		
- SCPL	0-8	Station Control Password Length (must be consistent network wide).
...		

LD 15 – Configure a Special Prefix Number (SPRE) for the customer.

Prompt	Response	Description
REQ:	CHG	Change.
TYPE:	FTR	Customer features and options.
CUST	xx	Customer number.
...		
- SPRE	xxxx	Special Prefix Number.
...		

LD 15 – Map the NARS/BARS access code to the incoming call types.

Prompt	Response	Description
REQ:	CHG	Change.
TYPE:	NET	Networking data.
CUST	xx	Customer number.
...		
AC2	aaaa	Access code 2, as defined in LD 86. aaaa = NPA, NXX, INTL, SPN, LOC.
ISDN	YES	ISDN capabilities.
- PNI	1-327000	Private Network Identifier.
...		
- - - HLOC	0-9999999 X	Home location code (ESN), 1-7 digits. X = delete digits.
...		

LD 10 – Set the Station Control Password and allow Call Forward.

Prompt	Response	Description
REQ:	CHG	Change.
TYPE:	500	Telephone type.
TN	l s c u	Terminal number, for Options 51C, 61C, 81C.
	c u	For Option 11C.
...		
SCPW	xxxxxxxx	Station Control Password (0 to 8 digits, defined in LD 15).
...		
CLS	CFXA	Call Forward to External DN allowed.
...		
FTR	aaaa	Feature configuration.
...		

LD 11 – Set the Station Control Password and allow Call Forward.

Prompt	Response	Description
REQ:	CHG	Change.
TYPE:	aaaa	Telephone type, where aaaa = SL1, 2006, 2008, 2009, 2016, 2018, 2112, 2216, 2317, 2616, or 3000.
TN	l s c u	Terminal number, for Options 51C, 61C, 81C.
	c u	For Option 11C.
...		
SCPW	xxxxxxxx	Station Control Password (0 to 8 digits, defined in LD 15).
...		

CLS	CFXA	Call Forward to External DN allowed.
...		
KEY	xx CFW 4-(16)-23	Assign Call Forward key (xx) and set the forwarding DN length.
...		

LD 16 – Configure the route data block.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	RDB	Route data block.
CUST	xx	Customer number.
...		
ISDN	YES	ISDN configuration.
...		
INAC	YES	Insert ESN access codes to incoming private network calls.
...		
- PNI	1-327000	Private Network Identifier.
...		

LD 57 – Define Remote Call Forward FFCs and set FFCT.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	FFC	Flexible Feature Codes.
CUST	xx	Customer number.

FFCT	(NO) YES	Confirmation tone is (is not) to be given after an FFC.
CODE	RCFA	Remote Call Forward Activate.
RCFA	xx	xx = RCFA code.
CODE	RCFD	Remote Call Forward Deactivate.
RCFD	xx	xx = RCFD code.
CODE	RCFV	Remote Call Forward Verify.
RCFV	xx	xx = RCFV code.

Attendant-based Configuration

LD 12 – Configure the Flexible Attendant feature key, RFW.

Configuration of the key on the Attendant Console is required to allow attendant access to the RCFW feature. Configuration of the RFW key is only allowed if the ARFW package is equipped.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	ATT 1250 2250	Attendant type – the RFW key can be configured on QCW4, M1250, M2250 and Swedish CD Attendant Consoles.
TN	l s c u	Terminal number, for Options 51C, 61C, 81C.
	c u	For Option 11C.
...		
KEY	xx RFW	Key number assigned as Attendant Remote Call Forward key.

LD 15 – Configure the Attendant RCFW password.

Prompt	Response	Description
REQ:	CHG	Change.
TYPE:	ATT	Attendant console.
CUST	xx	Customer number.
...		
- IRFR	(NO) YES	Internal Remote Call Forward Password required.
-- IRFP	xxxxxxxx	Internal RCFW Password (only prompted if the response to IRFR is YES). The password length is one to eight digits; the password is numeric only.
- XRFR	(NO) YES	External Remote Call Forward Password required.
-- XRFP	xxxxxxxx	External RCFW password (only prompted if the response to XRFR is YES). The password length is one to eight digits; the password is numeric only.
...		

LD 15 – Map the NARS/BARS access code to the incoming call types.

Prompt	Response	Description
REQ:	CHG	Change.
TYPE:	NET	Networking data.
CUST	xx	Customer number.
...		
AC2	aaaa	Access code 2, as defined in LD 86. aaaa = NPA, NXX, INTL, SPN, LOC.
ISDN	YES	ISDN capabilities.

- PNI ...	1-327000	Private Network Identifier.
- - - HLOC ...	0-9999999 X	Home location code (ESN), 1-7 digits. X = delete digits.

Feature operation

Network Wide Set-based Remote Call Forward

From the remote set dial:

1 FFC RCFA code.

2 SCPW for the set to be forwarded.

3 The complete DN of the set to be forwarded. This DN is the full DN required to call the set to be forwarded from the user's present location.

Expected Result: Provided everything is correct, confirmation tone is delivered to the user.

From the remote set continue dialing:

4 The CFW DN to be activated followed by the end of dial indicator (#).

Expected Result: Provided everything is correct, confirmation tone is delivered to the user.

Network Wide Attendant-based Remote Call Forward

From the Attendant Console, perform the following:

1 Press an idle loop key followed by the RFW key.

Expected Result: The RFW key is flashing and the Loop key is steady lit.

2 Dial the DN of the set to be forwarded.

Expected Result: If a password is required, the RFW key is winking, and the console display shows "PWD –". If the console does not support alpha characters, the display will be blank.

If a password is not required, the console display will show the DN of the set to be forwarded followed by the CFW DN stored on that set. The RFW key lamp will display the status of the CFW DN. If the RFW lamp is flashing, CFW is not active; if the RFW lamp is steady lit, CFW is active. Proceed to Step 4.

3 Dial the password followed by #.

Expected Result: The console display will show the DN of the set to be forwarded followed by the CFW DN stored on that set. The RFW key lamp will display the status of the CFW DN. If the RFW lamp is flashing, CFW is not active; if the RFW lamp is steady lit, CFW is active.

4 The user can now enter a new CFW DN or press the RFW key to activate or deactivate the stored CFW DN.

Expected Result: The console display will show the DN of the set to be forwarded followed by the CFW DN. If the RFW lamp is flashing, CFW is not active; if the RFW lamp is steady lit, CFW is active.

5 When RCFW operation is in this state, the user has the following three options:

- **a.** Press the Release or Release Source key to terminate RCFW operation.
- **b.** Press the RFW key to reverse the CFW status.
- **c.** Enter a new CFW DN to begin the task of changing the CFW DN programmed. The new CFW DN is not active until the RFW key is pressed again.

Attendant Blocking of Directory Number

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Feature Description

Attendant Blocking of Directory Number (DN) allows a person to dial the attendant DN and request an external (long distance) call, and then disconnect while waiting for the call to be processed by the attendant. The requesting DN is idle and can receive and make calls.

When the attendant is ready to make the external (long distance) call, the Attendant Blocking of DN feature provides the attendant with the ability to block the DN while the external call request is being processed. The line appears busy to any caller attempting to contact the blocked DN. The blocked DN cannot be used to originate a call and will be connected to the attendant if it goes off hook.

When the attendant has completed the external call, the blocked DN can be rung and the call extended. The attendant is guaranteed that the requesting DN is not busy and is available to take the call when the processing has been completed. This feature works in both stand-alone and Meridian Customer Defined Network (MCDN) environments.

Previously, this feature had been available on Swedish A345 PBXs, but now is also available on the Meridian 1. Although developed for Telia Sweden, the feature is applicable to all marketplaces desiring Attendant Blocking of DN functionality.

Operating parameters

The Attendant Blocking of DN feature can only be activated as the source party of the Loop key on the Attendant Console.

The attendant has the ability to use the Attendant Blocking of DN feature only for the following types of DNs: sets with ordinary Single Call Arrangement No Ringing key (SCN)/Single Call Arrangement Ringing key (SCR) DNs and PBX sets. HOT DNs, MCN/MCR DNs, ACD DNs, PLDNs, any trunk access code, FFCs, BRI and all other types of extensions are considered to be invalid for the Attendant Blocking of DN feature.

When the Attendant Blocking of DN feature is activated for a DN, it is only the DN dialed that is blocked. Other DNs assigned to the set will be idle.

If Attendant Blocking of DN is attempted on a Multiple Appearance Single Call Arrangement DN, all idle appearances of the DN will be blocked.

The Attendant Blocking of DN will only be supported on the following Attendant Console types: M2250; M1250; QCW4; QCW8; or M345CD.

The operation of this feature on an M2616 will not be supported in an Option 11C environment.

No new hardware is required for this feature.

Feature interactions

ACD

It is not possible to activate the Attendant Blocking of DN feature for an ACD DN. If an attempt to block an ACD DN is made, the attempt will be canceled and overflow tone will be returned. However, individual DNs on ACD sets can be blocked.

Advice of Charge for EuroISDN

For Advice of Charge at start of the call (AOC-S) and during the call (AOC-D), charging information is assigned respectively to the Attendant and the set's Message Registration (MR) meters for the charge incurred before and after the call transfer completion by an attendant. Advice of Charge at end of the call (AOC-E) charging information is assigned to the set's MR meter.

Attendant Hold

An Attendant Blocking of DN call can be put on hold by the attendant and will in this case be subject to normal Attendant Hold treatment. The Semi-automatic Camp-on (SACP) key lamp will be dark while on hold and be lit again when taken off hold. The same applies to Automatic Hold on the Loop key.

Automatic Redial

An Automatic Redial call is blocked from the calling party if an attendant uses the Attendant Blocking of Directory Number feature on the calling party's DN.

Break-in

The Attendant Blocking of DN and the source side Predial Break-in features are mutually exclusive for the same call. If the SACP key lamp is lit when the Break-in key is pressed to start a Predial Break-in attempt, the Break-in key is ignored. On the contrary, if the Break-in key lamp is lit and no call attempt is made on the source side when the SACP key is pressed to start an Attendant Blocking of DN, the SACP key is ignored.

If a Break-in attempt is made for an Attendant Blocking of DN call, the Break-in attempt will be considered to be temporarily denied.

It will be possible to Break-in on the destination side with an Attendant Blocking of DN call on the source side of the Attendant Console. The same limitations to Break-in will apply as if the source side call is a normal call.

Busy Lamp Field/Enhanced Busy Lamp Field

When a DN is blocked due to the Attendant Blocking of DN feature, the Busy Lamp Field/Enhanced Busy Lamp Field lamp corresponding to this DN displays the busy status of the DN as for ringing calls.

Busy Verify

The Attendant Blocking of DN and source-side Busy Verify are mutually exclusive for the same call. If the SACP key lamp is lit when the Busy Verify key is pressed to start a Busy Verify attempt, the Busy Verify key is ignored. On the contrary, if the Busy Verify lamp is lit when the SACP key is pressed to start an Attendant Blocking of DN attempt, the SACP key is ignored.

If a Busy Verify attempt is made on an Attendant Blocking of DN call, it will be denied.

Call Detail Recording Time to Answer

If the CDR Time to Answer feature is active, the time registration before answer will be started when the SACP key is pressed to ring the blocked DN and not when the DN is blocked.

Call Forward All Calls/Internal Calls/Call Forward and Busy Status

The Attendant Blocking of DN feature will override these Call Forward features. If the dialed DN of the set is idle, the DN can be blocked; if the DN is busy, busy tone will be heard.

Call Forward No Answer

The Attendant Blocking of DN feature will override the Call Forward No Answer feature. If the blocked DN of the set has the Call Forward No Answer feature active when the SACP key is pressed to ring the DN, the DN will ring until answered or disconnected. No Call Forward No Answer will be done for the Attendant Blocking of DN call.

Call Park

It is not possible to park an Attendant Blocking of DN call. If a Call Park call recalls to a blocked DN, the recall will be treated as if the DN is in a ringing state.

Call Waiting

If a set that has the Station-to station Call Waiting feature active (CLS SWA and a Call Waiting (CWT) key for digital sets) is idle when an Attendant Blocking of DN attempt is made, the Attendant Blocking of DN attempt will be allowed and processed as normal. If the DN is idle and there is an active call on the Call Waiting key, the Attendant Blocking of DN attempt will be allowed.

For a set that has the Call Waiting (or Station-to-station Call Waiting) feature active and a DN is blocked due to the Attendant Blocking of DN feature, any incoming call to the blocked DN will receive busy tone.

If a set has the Station-to-station Call Waiting feature active and the DN to be blocked is busy when an Attendant Blocking of DN attempt is made, the Attendant Blocking of DN attempt will be canceled and busy tone will be returned.

Camp-on

Camp-on will be denied for a DN that is blocked due to the Attendant Blocking of DN feature.

CDR Time to Answer

If the CDR Time to Answer feature is active, the time registration before answer will be started when the SACP key is pressed to ring the blocked DN and not when the DN is blocked.

Directory Number Delayed Ringing

The Attendant Blocking of DN feature will override the Directory Number Delayed Ringing feature and ring the blocked DN immediately when the SACP key is pressed to ring the blocked DN.

Do Not Disturb

The Attendant Blocking of DN feature will override the Do Not Disturb feature. If the dialed DN of the set that has the Do Not Disturb feature active is idle, the DN will be blocked and if the DN is busy, busy tone will be heard.

FFC Boss Secretary Filtering

The FFC Boss Secretary Filtering feature will be overridden. If an Attendant Blocking of DN attempt is made for a set that has the Boss Secretary Filtering feature active, the dialed DN will be blocked if idle. If it is busy, busy tone will be heard.

Flexible Feature Codes

If a Flexible Feature Code is dialed after pressing the SACP key to initiate an Attendant Blocking of DN attempt, overflow tone will be provided and the attempt canceled.

Group Hunting

It is not possible to activate the Attendant Blocking of DN feature for a Pilot DN (PLDN). If an attempt is made to block a PLDN, the attempt will be canceled and overflow tone will be returned. If a DN that is a member in a Group Hunt (or Hunt) list is blocked by the Attendant Blocking of DN feature, the DN is considered to be busy.

Hunting

If Attendant Blocking of DN is attempted on a busy DN having the Hunting feature active, busy tone will be returned (overriding the Hunting feature).

Idle Extension Notification

The Attendant Blocking of DN feature and the Idle Extension feature both use the SACP key for feature activation on the source side of the Attendant Console. The difference is that Attendant Blocking of DN only is valid when dialing a DN, whereas Idle Extension Notification only is valid when a busy DN is reached. If an Attendant Blocking of DN attempt is made for a DN that is busy, the Attendant Blocking of DN is canceled and it is possible to activate the Idle Extension Notification feature for the busy DN.

Intercept Computer Interface (ICP)

The Attendant Blocking of DN feature will override the ICP Call Forward feature. If the dialed DN of the set that has the ICP Call Forward feature active is idle, the DN will be blocked and if the DN is busy, busy tone will be heard.

ISDN Basic Rate Interface (BRI) Trunk Access

It is possible to use the Attendant Blocking of DN feature in an ISDN MCDN based on BRI TIE trunks if Network Attendant Service (NAS) is configured in the network.

Line Lockout

If an Attendant Blocking of DN attempt is made on a set in Line Lockout state, busy tone will be returned.

Make Set Busy

The Attendant Blocking of DN feature will override the Make Set Busy feature. If the dialed DN of the set that has the Make Set Busy feature is idle, the DN will be blocked and if the DN is busy, busy tone will be heard.

Multiple Appearance Multiple Call Arrangement

It is not possible to activate the Attendant Blocking of DN feature for a Multiple Appearance Multiple Call Arrangement DN (MCA DN (MCN/MCR)). If an attempt is made to block an MCA DN (MCN/MCR), the attempt will be canceled and overflow tone will be returned.

Multiple Appearance Single Call Arrangement

If Attendant Blocking of DN is attempted on a Multiple Appearance Single Call Arrangement DN (SCA DN (SCN/SCR)), all appearances of the DN will be blocked.

New Flexible Code Restriction

When the attendant has a blocked DN on the source side and dials on the destination side, any new Flexible Code Restriction active for the set of the blocked DN will be overridden. This is the same as if the attendant had a normal established call to the DN on the source side and dials the destination side.

Phantom TN

DNs on Phantom TNs cannot be blocked by the Attendant Blocking of DN feature; DNs on Phantom TNs will not be overridden by the Attendant Blocking of DN feature.

Radio Paging

If a transferred Radio Paging call recalls to a blocked DN, the recall will be treated as if the DN is in the ringing state.

Ring Again

It is possible to activate Ring Again towards a DN that is blocked due to the Attendant Blocking of DN feature.

Ringing Change Key

When the SACP key (or Signal Source) key is pressed to ring a blocked SCR where the Ring Change feature is activated, an audible ring signal will always be given. This is independent of the Ring Change status.

Ring/Hold LED Status

When a DN is blocked, the status of the DN lamp will be according to the Ring/Hold LED status for ringing calls.

Semi-automatic Camp-on

The Attendant Blocking of DN feature uses the SACP key to activate a blocking attempt, but the Attendant Blocking of DN feature is only valid on the source side of the Attendant Console. The Semi-automatic Camp-on feature is only valid on the destination side of the Attendant Console.

To have the Attendant Blocking of DN feature available and not the Semi-automatic Camp-on feature, a new response to the SACP prompt has been introduced in LD 15. Prompt SACP = NO means the Semi-automatic Camp-on feature is not available even if the SACP package is equipped and an SACP key exists on the Attendant Console. To have the Semi-automatic Camp-on feature available the SACP prompt must be answered with SNGL or ALL which have the same meanings as before.

Signal Source

The Signal Source key can be used to notify a blocked DN. Using the Signal Source key for an Attendant Blocking of DN call will give the same response as the SACP key when the DN is blocked (i.e., ring the blocked DN and darken the SACP key lamp). The Signal Source key cannot be used to initiate an Attendant Blocking of DN call.

Single Call No Ringing DN

When the SACP (or Signal Source) key is pressed to ring a blocked Single Call No Ringing DN (SCN), an audible ring signal will be given.

Source Included when Attendant Dials

The Attendant Blocking of DN feature will follow the current Source Included when Attendant Dialing handling, depending on what is configured.

Vacant Number Routing

The Attendant Blocking of DN feature will work across an ISDN network if the call is routed due to the Vacant Number Routing feature.

Feature packaging

The following package is required for Attendant Blocking of Directory Number:

- Semi-automatic Camp-on (SACP) package 181.

For an ISDN network environment, the following software package is required:

- Network Attendant Services (NAS) package 159.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 12 – Configure the SACP key on the Attendant Console.

2 LD 15 – Modify the Customer Data Block.

LD 12 – Configure the SACP key on the Attendant Console.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	aaaa	Type of console, where aaaa = 1250 for M1250 console, 2250 for M2250 console, ATT for QCW3, QCW4 console, or PWR if the TN is used for power or Attendant Supervisory Module ASM.
TN	l s c u	Terminal Number, for Options 51C, 61C, 81C.
	c u	For Option 11C.

...		
KEY	xx SACP	Semi-automatic Camp-on key.

LD 15 – Modify the Customer Data Block.

Prompt	Response	Description
REQ:	CHG	Change.
TYPE:	ATT	Attendant Console options.
CUST	xx	Customer number.
...		
ATT	YES	Change Attendant Console options.
...		
- SACP	(NO) ALL SNGL	Semi-automatic Camp-on not allowed. Semi-automatic Camp-on for all Camp-on occurrences. Semi-automatic Camp-on an a per call basis.
- ABDN	(NO) YES	Activation of the Attendant Blocking of DN feature is (not) allowed. The ABDN prompt only appears when the SACP package is equipped.

Feature operation

To block a DN

1 The attendant presses an idle Loop key.

2 The attendant presses the Semi-automatic Camp-on (SACP) key.

3 The SACP key lamp lights.

4 The attendant dials the source DN that is to be blocked. If the dialed DN is idle, the DN lamp will have the same state as if it were ringing, but the DN will not ring. If the DN is busy, the attendant hears busy tone and the SACP key lamp darkens.

5 If the dialed DN is idle, it is blocked. The DN lamp indicates a ringing state, although the DN will not ring (for PBX telephones, there is no indication that the DN is blocked.) On the Attendant Console, the SACP key lamp remains lit and the Source key lamp begins blinking.

If the dialed DN is busy, the attendant presses the Release (or Release SRC) key to release the call.

End of Procedure

To place an outgoing call for the blocked DN

1 The attendant establishes a call to the desired destination in the normal way.

2 The attendant presses the SACP (or Signal SRC) key. The ringback tone is heard.

3 If the source DN answers, the attendant presses the Release key to extend the call between the destination to the source.

End of Procedure

To release a blocked DN

The attendant presses either the SACP key or Signal Source key to ring the DN
–or–
The attendant presses either the Release key or the Release Source key to release the source DN, which then becomes idle.

End of Procedure

To notify a blocked DN of an established call

The attendant presses the SACP or Signal Source key.

End of Procedure

Attendant Through Dialing Networkwide

Contents

The following are the topics in this section:

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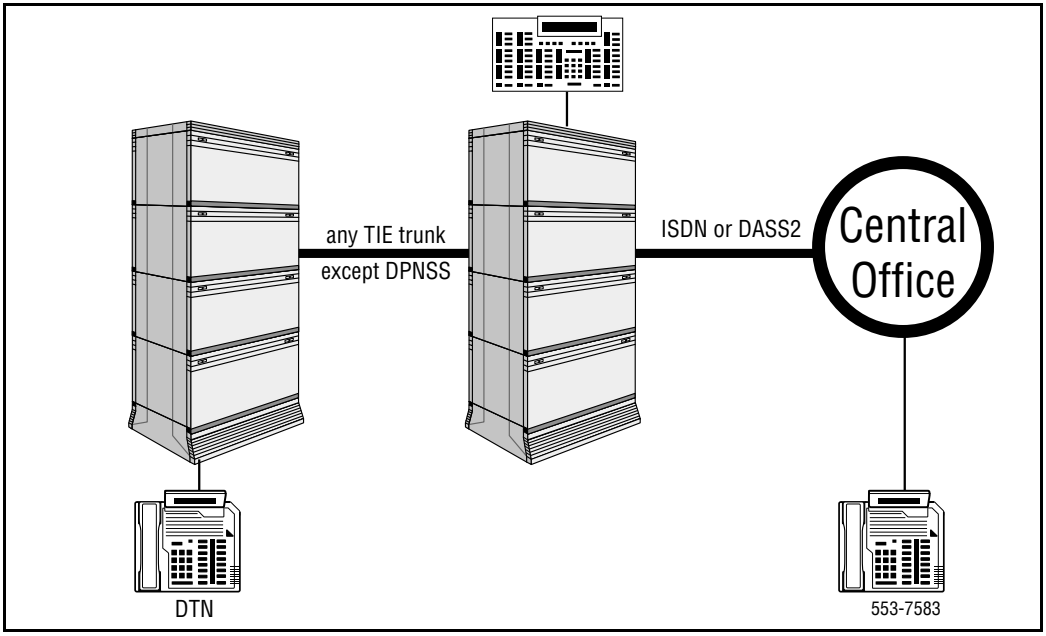
Feature Description

Attendant Through Dialing Networkwide extends the functionality of through dialing via an attendant to any Integrated Services Digital Network (ISDN) or DASS2 outgoing trunk. This feature allows an attendant to seize an outgoing Integrated Services Digital Network (ISDN) or DASS2 trunk for a calling party located on the same or another node.

In the existing standalone capacity, Attendant Through Dialing allows internal callers to request an outgoing trunk except DPNSS from an attendant. In the existing network capacity, Attendant Through Dialing allows callers linked by any TIE trunk to request an analog or DTI2 trunk from the attendant.

Figure 6 illustrates Attendant Through Dialing Networkwide.

Figure 6
Attendant Through Dialing Networkwide



When requested, the attendant dials a specific code and extends the call once the Destination (DEST) lamp lights. When the attendant accessed the trunk the caller was free to dial out. However, with standalone Attendant Through Dialing, the outgoing trunk seized must be either an analog or digital trunk. Attendant Through Dialing Networkwide enhances the through dialing networkwide capability to ISDN or DASS2 outgoing trunks.

When this feature is provisioned, an attendant seizes the outgoing trunk by pressing the Release (RLS) key. Following this, the call is extended back to the calling party who receives dial tone and dials the remaining digits.

This feature is applicable in situations where the calling party is not permitted to dial a defined code that provides access to a public or international network or other costly telecom services. In these situations, the calling party requests that the attendant dial a numbering plan for the calling party, seize an external trunk and extend the call back to the calling party.

Table 25 shows situations when the attendant is allowed to press the Release (RLS) key depending on the type of numbering plan implemented by a customer.

Table 25
Numbering Plans and Attendant Release of external trunk

Numbering Plan used to seize external trunk	Destination (DEST) becomes lit
Route Access Code	After Route Access Code
Flexible Numbering Plan	After Special Number
Coordinated Dialing Plan	After Trunk Steering Code

Operating parameters

This feature supports the all ISDN trunk types on Basic Rate Interface (BRI) and Primary Rate Interface (PRI). Attendant Through Dialing Networkwide is also supported over analog, DTI and DIT2 trunks.

The Attendant Through Dialing Networkwide feature is not supported over DPNSS. Therefore, an established link cannot be a DPNSS trunk if the outgoing trunk is ISDN or DASS2.

Attendant Through Dialing Networkwide is configured to override/bypass Access Restrictions configured as New Flexible Code Restrictions. Other access restrictions such as Access Restrictions, Schedules Access Restrictions and Trunk Barring are not affected by Attendant Through Dialing Networkwide.

This feature is not supported on sets configured with Dial Pulse (CLS = DIP). Attendant Through Dialing Networkwide is only supported on set configured with Digitone (CLS = DTN).

Attendant Through Dialing Networkwide is available on all types of dialing configurations on ISDN routes, Enbloc or Overlap Signaling. However, if the attendant dials a Trunk Steering Code or Special Number, the outgoing ISDN trunk must support Overlap Signaling.

If an attendant dials a Trunk Steering Code or Special Number over an ISDN trunk connected to a Central Office/Public Exchange, the outgoing trunk must support Overlap Signaling.

Attendant Through Dialing Networkwide allows a caller to bypass all trunk access restrictions at the set level. Once a caller begins dialing an external number, the digits dialed are not analyzed for Access Restrictions, Call Connection Restrictions.

An attendant cannot extend a call back to a caller after dialing an Electronic Switched Network (ESN) access code (AC1/AC2) even if a tone is detected. The route being used is unknown at this time. Therefore, if the access code to the public network is defined as AC1 or AC2, the attendant must dial additional digits, such as a Special Number, before being allowed to press the Release key.

The Attendant Through Dialing Networkwide feature is not supported if the outgoing trunk on the attendant's node is Virtual Network Service (VNS) trunk.

When a calling party requests through dialing, their set display is updated. The called party's display receives the attendant's name or number and maintains this information throughout the duration of the call.

Feature interactions

Autodial

Attendant Through Dialing Networkwide supports Autodial provided that the stored Autodial number excludes the digits previously dialed by an Attendant.

Call Detail Recording

The record on the outgoing trunk node shows the outgoing trunk in the terminating ID field.

No record is output on the Attendant's node for the Destination (DEST) side during call extension. This occurs regardless of the configuration for the outgoing trunk. All other records are produced according to configuration.

If the Calling Line Identification (CLID) option is activated in the Call Detail Recording, the calling party's Directory Number (DN) is printed in the Attendant's node.

If End-to-End Signaling is used to establish a link, the ECDR prompt in Overlay 15 can be used to print End-to-End Signaling digits in the CDR record.

ISDN QSIG/EuroISDN Call Completion

The Call Completion to Busy Subscriber and the Call Completion on No Reply functionalities are not supported if an external call is initiated by the Attendant Through Dialing Networkwide feature.

Last Number Redial

Last Number Redial is not supported when the attendant extends a call back and the caller begins dialing digits.

Network Attendant Service

Network Attendant service can be used on the Meridian Customer Defined Network (MCDN) to automatically locate an attendant from one node to another.

When Attendant Through Dialing Networkwide is provisioned, the Attendant's Destination (DEST) lamp is updated after dialing Route Access Code, Trunk Steering Code or Special Number rather than waiting for the ALERTING message.

Pretranslation

Pretranslation is supported during the attendant dialing phase. The attendant dials a pretranslated digit in the Trunk Steering Code, Route Access Code or Special Number to seize an external trunk. Pretranslation is not supported in the through dialing phase. Therefore, once the attendant extends the call back to the caller, the first digit the calling party dials is not pretranslated even if the calling party has pretranslation configured.

Recovery on Misoperation of the Attendant Console

The Attendant Through Dialing feature allows the attendant to press the RLS (Release) key or another Loop key when the called is party is ringing without misoperating the console.

Speed Call

Speed Call is only supported in the attendant dialing phase. Speed Call is not supported once the caller begins dialing an external number. Once an external call is established, the caller cannot press the SCU (Speed Call User) key.

Stored Number Redial

Digits dialed by the caller using End-to-End Signaling are not retained by the Stored Number Redial feature.

Feature packaging

Attendant Through Dialing Networkwide requires the following packages:

- End-to-End Signaling (EES) package 10
- Integrated Services Digital Network (ISDN) package 145
- Overlap Signaling (OVLP) package 184
- New Format Call Detail Recording (FCDR) package 234

Attendant Through Dialing Networkwide also requires **one** of the following dialing plans:

- Basic Alternate Route Selection (BARS) package 57
- Network Alternate Route Selection (NARS) package 58
- Coordinated Dialing Plan (CDP) package 59
- Flexible Number Plan (FNP) package 160

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 15 – Allow Attendant Through Dialing Networkwide.

2 LD 15 – Configure Improved End-to-End Signaling.

3 LD 17 – Allow Calling Line Identification (CLID) field in Call Detail Recording (CDR) records.

LD 15 – Allow Attendant Through Dialing Networkwide.

Prompt	Response	Description
REQ:	CHG	Change existing data.
TYPE:	ATT	Attendant Console data block.
CUST	xx	Customer number.
OPT	(ATDA)	Attendant Through Dialing Allowed (default). ATDD = Attendant Through Dialing Denied.

Note: The configuration of Improved End-to-End Signaling in Overlay 15 and Calling Line Identification in Call Detail Recording Record are optional. Improved End-to-End Signaling sends the digits dialed by the calling party on the established link in a more efficient manner than End-to-End Signaling. A Call Detail Recording record on the outgoing trunk node shows the outgoing trunk in the ID field and the calling Directory Number in the CLID field if the outgoing trunk is on the attendant's node.

LD 15 – Configure Improved End-to-End Signaling.

Note: Improved End-to-End Signaling is provided when EEST = YES and DTMF = NO.

Prompt	Response	Description
REQ:	CHG	Change existing data.
TYPE:	FTR	Customer Features and options.
CUST	xx	Customer number.
...		
EEST	YES	Send feedback tone to the originator of End-to-End Signaling.
- DTMF	NO	Improved End-to-End Signaling for single tone feedback.

LD 17 – Allow Calling Line Identification (CLID) field in Call Detail Recording (CDR) records.

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	PARM	System parameters.
...		
- FCDR	 (OLD) NEW	Format for Call Detail Recording OLD CDR format (default). NEW CDR format.
...		
- CLID	YES	Calling Line Identification in Call Detail Recording.

Feature operation

1. Calling party dials an attendant that is located either on the same node as the caller or another node.
2. Calling party requests the attendant to seize an outgoing external trunk. This external trunk is located on either the same node or on another node.
3. The attendant dials a Trunk Steering Code, Special Number or Route Access Code to access the public network and waits for the lighting of the DEST lamp on the console. If the attendant dials either a Trunk Steering Code or a Special Number and the external trunk is an ISDN trunk, if must support Overlap Signaling. If the attendant dials a Route Access Code and the outgoing external is an type ISDN trunk then any type of dialing is supported.
4. When the DEST lamp is lit, then the attendant presses the Release (RLS) key or another loop key to extend the call back to the calling party requesting an outgoing external trunk.
5. The calling party hears dial tone and dials an external number.

Australia ETSI

Contents

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Feature description

The Australia ETSI feature supports 2.0 Mb ISDN Primary Rate Interface and Basic Rate Interface Trunk connectivity for the Australian Central Office, in compliance with the Australia ETSI specification (Telstra).

This feature uses the existing EuroISDN software packages to provide the basic ISDN capabilities and supplementary services listed below (EURO is configured as the interface in the overlay programs when configuring PRI2 and BRI).

Basic ISDN services:

- 2.0 Mb PRI and BRI Basic Call Service

- Circuit-mode bearer capabilities (speech, 3.1 kHz audio, 64 kbps digital, and adapted 56 kbps to 64 kbps digital)
- COT, DID, DOD, and TIE trunk call types
- Calling Line Identification (public and private)
- Enbloc Sending
- Overlap Sending
- Channel Negotiation

Supplementary services:

- Calling Line Identification Presentation (CLIP)
- Calling Line Identification Restriction (CLIR)
- Connected Line Identification Presentation (COLP)
- Connected Line Identification Restriction (COLR)
- Malicious Call Trace
- Advice of Charge (AOC), during call set-up, during the call, and at end of call
- Sub-addressing (SUB)
- Direct Dial In (DDI)

Operating parameters

This feature requires downloadable D-Channel handling, for both the large systems (Options 51C, 61C, 81C) and the small system (Option 11C).

Overlap Receiving is not supported.

Basic Alternate Route Selection (BARS) is not supported. Network Alternate Route Selection (NARS) is.

In a Meridian Customer Defined Network (MCDN), receiving Calling Party Name Display (CPND) and sending a CPND are not supported

MCDN Call Redirection (Call Forward, Call Forward No Answer, Hunt) is not supported.

MCDN Call Modification (Conference, Transfer) is not supported.

Network Call Redirection, Network Call Forward, and Network Call Forward No Answer (MCDN Component) are not supported.

Network Attendant Service (NAS) features are not supported across the Australia ETSI interface; however, incoming calls may be NAS routed from another node.

Trunk Route Optimization is not supported across the Australia ETSI interface.

All operating parameters apply to feature as for the EuroISDN Advice of Charge and Malicious Call Trace functionalities.

The Advice of Charge functionality is supported on a system basis only. It is not supported on a per call basis.

Reverse Charging is not supported, nor is requesting charging information from the user's side.

Tandeming of Advice of Charge charging information across a Meridian 1 network is not supported.

The display of charges is not supported on BRI sets and terminals.

Packet data handling is not supported for the BRI component of this feature.

Feature interactions

Calling Line Identification Enhancements

Prior to the CLID Enhancements feature, the Customer Data Block (Overlay 15) contained the prompts PFX1 and PFX2 (for Prefix 1 and Prefix 2) that were used to construct the CLID. The combination of PFX1, PFX2 and the originating DN were used to construct a correct number for the called party to dial in order to reach the calling party.

If no digits are configured for either of the prefixes, then that part of the number will not be included in the Calling Party Number. Essentially, this meant that the CLID could only be built from key 0 of a set. Regardless of what key was used to make a call, it was the CLID for key 0 that was sent. Also, only one office code and one location code could have been assigned in the CLID for a customer.

With the introduction of the ISDN CLID Enhancements feature, PFX1 and PFX2 are no longer used to construct the CLID. CLID is now table-driven (when Overlay 15 is loaded, a customer can configure a CLID table), and virtually any of the information contained in the fields of the CLID table can now be programmed against any DN or DN key, on a per set basis.

This means that the CLID that is sent from a set is now predicated on what is in the CLID table, rather than the LDN or PDN. That is, a CLID for any key is now built by taking the information contained in a particular field in the CLID table and adding that information to the key's DN. A multi-line set can now have DN keys that each has their own CLID. Or, the CLID of any one key on a set could be programmed to use the CLID of any other key on the set.

The construction of CLID is based on the CPFXS prompt in Overlay 16. If CPFXS = NO, then when constructing the Calling Number, the prefixes are retrieved from the Route Data Block via the responses to the HNTN and HLCL prompts. If CPFXS = YES, which is the default response, then CLID is built depending upon the prefixes HNTN and HLCL retrieved from the Customer Data Block (Overlay 15) via the entries in the CLID table (refer to the paragraph above for more details).

Also, the Meridian 1 can now support multiple office codes, location codes and steering codes in CLID. This means that any telephone set on one Meridian 1 can send a CLID that will have calls returned to another Meridian 1. This type of configuration is typically used in cases where a customer wants calls to be returned to only one central location.

How a CLID table is built

Prompts have been added to Overlay 15 that create a CLID table for a customer. This table contains up to 4,000 CLID "entries." Each entry contains unique information pertaining to CLID, as explained in the following sections.

For users of an International Numbering Plan, the Meridian 1 now supports multiple Prefix 1 (PFX1) and Prefix 2 (PFX2) contents, and multiple Home Location Codes (HLOCs) and Local Steering Codes (LSCs), on a DN or DN key basis.

For an International Numbering Plan, each CLID entry can now contain the following:

- a 1 -6 digit national code for a home national number (HNTN), which is the equivalent of PFX1
- a 1 -12 digit local code for a home local number (HLCL), which is the equivalent of PFX2, or a one-12 digit Listed Directory Number for a switchboard
- a 1- 7 digit Home Location Code (HLOC)
- a 1 -7 digit Local Steering Code (LSC)

Another new capability pertains to how the HLCL is constructed. A new prompt, DIDN (which signifies “use DN as a DID number”) in Overlay 15, allows the HLCL to be built either using the digits in the HLCL plus the digits of the active key (if DIDN is set to YES, the DN is considered to be a DID number and is included in the CLID), or only the digits in the HLCL (if DIDN is set to NO, the DN is not included in the CLID since it is not a DID number), or based on a search on the DN keys, beginning from key 0, to find the CLID to be used (DIDN is set to SRCH).

Connected Line Identification Presentation and Restriction (COLP and COLR)

The Connected Line Identification Restriction (COLR) supplementary service takes precedence over the COLP supplementary service. The COLP service can take precedence over COLR service if the calling user has an override category.

The same Class of Service is used to control both Connected Line Identification Restriction and Calling Line Identification Restriction (CLIR). Thus, if a user has presentation restricted configured, their number is sent to the other party for both incoming and outgoing calls with the presentation flag set to restricted.

Coordinated Dialing Plan (CDP)

A Coordinated Dialing Plan (CDP) can be used to access an Australia ETSI trunk. However, neither the CDP private plan nor the CDP numbering type is supported. They get converted to unknown plan and type, respectively.

Virtual Network Services (VNS)

It is not possible to configure an Australia ETSI D-channel as a VNS D-channel. However, the voice connection through the Public Exchange of a VNS call may use a PRI/BRI COT or DID as a virtual TIE trunk.

Feature packaging

There are no new software packages required for this feature. However, the following packages are necessary in order to connect the Meridian 1 over an Australia ETSI PRI2/BRI interface to a Central Office.

For PRI2 connectivity:

- Integrated Services Digital Network (ISDN) package 145
- 2.0 Mbps Primary Rate Interface (PRI2) package 154
- Overlap Signaling (OVLP) package 184
- International Primary Rate Access (IPRA) package 202
- Multi-Purpose Serial Data Link (MSDL) package 222

If the call is to interwork with any other trunk, the Universal ISDN Gateway (UIGW) package 283 is required.

For the Advice of Charge capability:

- Controlled Class of Service (CCOS) package 81
- Background Terminal (BGD) package 99
- Periodic Pulse Metering/Message Registration (MR) package 101
- International Supplementary Features (SUPP) package 131

For the Malicious Call Trace capability:

- Controlled Class of Service (CCOS) package 81
- Malicious Call Trace (MCT) package 107

- International Supplementary Features (SUPP) package 131
- Flexible Features Code (FFC) package 139
- Network Attendant Service (NAS) package 159
- ISDN Supplementary Features (ISDN INTL SUP) package 161

For ISDN Basic Rate Interface Trunking connectivity:

- Basic Rate Interface (BRI) package 216
- Basic Rate Interface Trunk (BRIT) package 233

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 17 - Configure a PRI2 loop for the ETSI Australian ISDN connectivity.

2 LD 17 - Configure the D-channel for ETSI Australian ISDN connectivity.

3 LD 16 - Configure the ETSI Australian ISDN PRI2 Route Data Block.

4 LD 14 - Configure the Australia ETSI ISDN PRI2 trunks.

5 LD 17 - Configure Advice of Charge for Australia ETSI.

6 LD 15 - Allow Charge Display and CDR Charge.

7 LD 10 - Assign meters to analog (500/2500) sets.

8 LD 11 - Assign meters to Meridian proprietary sets.

9 LD 16 - Allow Advice of Charge on the route configured for Australia ETSI.

10 LD 27 - Define a Link Access Procedure on the D-channel (LAPD) protocol group.

11 LD 16 - Configure Route Data Block parameters for the ISDN BRI Trunk access capability.

12 LD 27 - Configure for a Multi-purpose ISDN Signaling Processor (MISP) for an ISDN BRI trunk.

13 LD 27 - Configure an S/T Interface (SILC) or U-Interface (UILC) line card, for an ISDN BRI trunk.

14 LD 27 - Configure a Digital Subscriber Loop (DSL) for an ISDN BRI trunk.

15 LD 27 - Assign meters to a DSL (this step is required for Advice of Charge). The MR/PPM package 101 must be equipped on the Meridian 1.

16 LD 16 - Allow Advice of Charge on the route configured for the Australia ETSI.

Primary Rate Configuration

LD 17 - Configure a PRI2 loop for the ETSI Australian ISDN connectivity.

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	CEQU	Make changes to Common Equipment parameters.
...		
- PRI2	0-159 1-9	PRI2 loop number, for Option 51C-81C. For Option 11C.
...		

LD 17 - Configure the D-channel for ETSI Australian ISDN connectivity.

Prompt	Response	Description
REQ	CHG	CHG = Change existing data.
TYPE	ADAN	Action device and number.
- ADAN	NEW DCH xx	Add a D-channel on logical port 0-63 (Options 51C-81C).
	NEW DCH xx	Add a D-channel on logical port 0-15 (Option 11C).

- CTYP	MSDL	Multi-purpose Serial Data Link card or Downloadable D-Channel Daughterboard (Options 51C-81C). Downloadable D-Channel Daughterboard (Option 11C).
- GRP	0-4	Network group number (Options 81C).
- DNUM	0-15	Device number for I/O ports (Options 51C-81C). All ports on the MSDL card share the same DNUM. The MSDL card address settings must match the DNUM value.
- CDNO	1-9	The card number of the Downloadable D-Channel Daughterboard (Option 11C).
- PORT	0-3 1	Port number on the MSDL card. For Option 11C.
...		
- USR	PRI	This D-channel is used for Primary Rate only.
- IFC	EURO	EuroISDN interface.
- - CNTY	EAUS	Australia ETSI.
- - PINX_CUST	0-99	The customer number to be used for the DN address translation associated with call independent connection messages received on the D-Channel.
...		
- - DCHL	0-159	PRI2 loop number for D-channel.
	1-9	PRI2 loop number for D-channel (Option 11C).
- CNEG	(1) 2	Options for outgoing Channel Negotiation. Option 1: Channel is non-negotiable. Option 2: The Channel listed is preferred, but negotiable.
- RLS	xx	Software Release of the far-end switch.

- RCAP		Remote capabilities, prompted to configure the Connected Line ID Presentation supplementary service. Multiple entries are allowed if separated by a space.
	(COLP) XCOL MCID XMCI	CLID Presentation supported. To remove COLP. Allow Malicious Call Trace Remove Malicious Call Trace.
- RCAP	aaaa	Remote capabilities is reprompted to enable the user to enter a <CR>, exiting from this prompt, or to change an existing remote capability value.
- OVLS	YES	Allow Overlap Sending.
- - OVLT	(0)-8	Duration of time, in seconds, that the sending side has to wait between INFO messages are sent. “0” means send immediately
- TIMR	YES	Change programmable timers. Only supported for interfaces supporting one of the following timers.
- - T310	(30)-100	Maximum time in seconds between an incoming CALL PROCEEDING message and the next incoming message.
- - INC_T306	0-(120)-240	Variable timer, in seconds, for received DISCONNECT message on incoming calls allowing in-band tone to be heard. The network will stop sending after this timer times out. The value is stored in two-second increments, which are rounded up.
- - OUT_T306	0-(120)-240	Variable timer, in seconds, for received DISCONNECT message on outgoing calls allowing in-band tone to be heard. The network will stop sending after this timer times out. The value is stored in two-second increments, which are rounded up.
- LAPD	(NO) YES	(Do not) allow the changing of the layer 2 timer.
...		

LD 16 - Configure the ETSI Australian ISDN PRI2 Route Data Block.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	RDB	Route Data Block.
CUST	xx	Customer number. xx = 0-99 (Options 51C-81C). xx = 0-31 (Option 11C).
ROUT	0-511 0-127	Route number (Options 51C-81C). Route number (Option 11C)
TKTP	TIE COT DID	TIE trunk type. Central Office Trunk type. Direct Inward Dialing trunk type.
...		
DTRK	YES	Digital trunk route.
- DGTP	PRI2	2.0 Mb PRI digital trunk type.
...		
ISDN	YES	Integrated Services Digital Network.
- MODE	PRA	ISDN PRI route.
- IFC	EURO	EuroISDN interface.
- - CNTY	EAUS	Australia ETSI.
...		
ICOG	 IAO ICT OGT	Incoming and/or Outgoing trunk. The trunk is Incoming and Outgoing. The trunk is Incoming only. The trunk is Outgoing only.
...		
ACOD	x...x	The Access Code for the trunk route. The Access Code must not conflict with the numbering plan.

...		
MCTS	YES	Enable MCT signaling.
...		
- MCTM	(0)-30	Malicious Call Trace disconnect delay timer (this timer overrides the T306 timer for calls originating or terminating on sets with MCT Class of Service).
- MTND	(NO) YES	(Do not) apply a Malicious Call Trace disconnect delay for tandem calls.

LD 14 - Configure the Australia ETSI ISDN PRI2 trunks.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	TIE COT DID	TIE trunk data block. Central Office Trunk data block. Direct Inward Dialing trunk data block.
		Note: Must match TKTP defined in LD 16.
TN		Loop and channel for digital trunks (Options 51C-81C), where:
	l ch	Previously defined PRI2 loops. Channel 1-30
	cu	card and unit (Option 11C).
CUST	xx	Customer number, as defined in LD 15.
RTMB	0-511 1-510 0-127 1-510	Route number and member number (Options 51C-81C). Route number and member number (Option 11C).
...		
TGAR	0 - (1) - 30	Trunk Group Access Restriction The default of 1 automatically blocks direct access.

LD 17 - Configure Advice of Charge for Australia ETSI.

Note: The MR package 101 must be equipped on the Meridian 1.

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	PARM	Change system parameters,
...		
OCAC	(NO) YES	(Do not) support the Original Carrier Access Code format.
MTRO	PPM	Use Periodic Pulse Metering as the metering option. The default is MR, for Message Registration.
...		

LD 15 - Allow Charge Display and CDR Charge.

Prompt	Response	Description
REQ:	CHG	Change existing data.
TYPE:	PPM	Periodic Pulse Data.
CUST	xx	Customer number defined for this feature. xx = 0-99 for Options 51C-81C. xx = 0-31 for Option 11C.
OPT	CHDA	Charge Display Allowed.
...		
UCST	(0)-9999	Unit cost for PPM.
...		

LD 10 - Assign meters to analog (500/2500) sets.

Prompt	Response	Description
REQ:	NEW CHG	Add new data. Change existing data.
TYPE:	500	Analog set.
TN		TN address
	l s c u c u	Loop, shelf, card, and unit (Options 51C-81C). Card and unit (Option 11C).
DES	x...x	ODAS Station Designator.
CUST	xx	Customer number, as defined in LD 15.
...		
DN	x...x yyy	Directory Number (x...x) and CLID entry (yyy).
...		
TGAR	0 - (1) - 30	Trunk Group Access Restriction The default of 1 automatically blocks direct access.
...		
CLS	MRA	Message registration Allowed.
...		

LD 11 - Assign meters to Meridian proprietary sets.

Prompt	Response	Description
REQ:	NEW CHG	Add new data. Change existing data.
TYPE:	aaa	Telephone set type.

TN		TN address
	l s c u c u	Loop, shelf, card, and unit (Options 51C-81C). Card and unit (Option 11C).
DES	x...x	ODAS Station Designator.
CUST	xx	Customer number, as defined in LD 15.
...		
TGAR	0 - (1) - 30	Trunk Group Access Restriction The default of 1 automatically blocks direct access.
...		
CLS	MRA	Message registration Allowed.
...		
KEY	xx aaa yyy	Telephone function key assignments.
...		

LD 16 - Allow Advice of Charge on the route configured for Australia ETSI.

Prompt	**Response**	**Description**
REQ	NEW CHG	Add new data. Change existing data.
TYPE	RDB	Route Data Block.
CUST	xx	Customer number, as defined in LD 15. xx = 0-99 (Options 51C-81C). xx = 0-31 (Option 11C).
ROUT	0-511 0-127	Route number, as previously configured (Options 51C-81C). Route number, as previously configured (Option 11C).
TKTP	TIE COT DID	TIE trunk type. Central Office Trunk type. Direct Inward Dialing trunk type.

...		
DTRK	YES	Digital trunk route.
- DGTP	PRI2	2.0 Mb PRI digital trunk type.
...		
ISDN	YES	Integrated Services Digital Network.
- MODE	PRA	ISDN PRI route.
- IFC	EURO	EuroISDN interface.
- - CNTY	EAUS	Australia ETSI.
...		
CDR	YES	Include AOC information in the CDR ticket.
...		
- OAL	YES	CDR on all answered outgoing calls.
- - OTL	YES	CDR on all outgoing toll calls.
...		
MR	STAC DURC ENDC	Define AOC at call set-up. Define AOC during the call. Define AOC at end of call.
DSPD	(NO) YES	(Do not) display the charge during the call.
...		
RUCS	0-9999	Route unit cost.
RURC	X Y	Route unit reference cost. Formula is $X*10^{(-Y)}$ where X = 0-9999, Y = 0-3. The default value for X is the value that is entered for RUCS.

RUCF	1 0	Route unit conversion factor. 0 = No conversion is required.
DSPT	0-(10)-60	Charge display timer.
...		

ISDN BRI configuration

LD 27 - Define a Link Access Procedure on the D-channel (LAPD) protocol group.

The protocol configuration procedures define the protocols used by ISDN BRI DSLs to communicate over ISDN. These protocol groups support various ISDN communication standards used in Europe, and other continents and countries.

Prompt	Response	Comment
REQ	NEW	Add an ISDN protocol group
TYPE	LAPD	LAPD Protocol group
PGPN	0-15 <CR>	Protocol group number <CR> =Stops this prompt from being displayed again
LAPD	(NO) YES	LAPD parameters. (NO) = Does not prompt the LAPD parameters and assigns the default values shown in ( ) to these parameters. YES = Define or modify the LAPD parameters.
USER	(NO) YES	(Do not) print groups selected at PGN prompt.
- T200	(2)-40	Retransmission timer specifies the time delay before the system retransmits the information. Delay is in increments of 0.5 seconds.
- T203	4-(20)-80	Maximum time between transmission frames Delay is in increments of 0.5 seconds.
- N200	1-(3)-8	Maximum number of retransmissions of unsuccessfully transmitted information.

Prompt	Response	Comment
- N201	4-(260)	Maximum number of contiguous octets or bytes of information.
- K	(1)-32	Maximum number of outstanding negative acknowledgment (NAKs) allowed before alarming the system.
PGPN	<CR>	Press <CR> to prevent repetition of all the parameters starting with LAPD.

LD 16 - Configure Route Data Block parameters for the ISDN BRI Trunk access capability.

Prompt	Response	Comment
REQ	NEW	Add new data (ISDN BRI protocol group settings).
TYPE	RDB	Route Data Block.
CUST	xx	Customer number, as defined in LD 15. xx = 0-99 (Options 51C-81C). xx = 0-31 (Option 11C).
ROUT	0-511 0-127	Route number, as previously configured (Options 51C-81C). Route number, as previously configured (Option 11C).
TKTP	TIE COT DID	TIE trunk type. COT Central Office Trunk trunk type. Direct Inward Dialing trunk type.
...		
DTRK	YES	BRI Digital Trunk Route
BRIP	NO	ISDN BRI packet handler route (NO is entered, since packet data is not required).
- DGTP	BRI	Digital trunk type.
ISDN	YES	Integrated Services Digital Network.

Prompt	Response	Comment
...		
- IFC	EURO	EuroISDN interface.
- - CNTY	EAUS	Australia ETSI.
- CNEG	(NO) YES	(Do not) allow Channel Negotiation.
...		
OVLS	(NO) YES	(Do not) allow Overlap Sending.
- OVLT	(0)-8	Overlap Timer in seconds. This timer controls the interval between the sending of INFORMATION messages. “0”, the default, means send immediately.
- PGPN	0-15	Protocol Group Number, as defined in LD 27.
- RCAP		Remote capabilities, prompted to configure the Connected Line ID Presentation supplementary service. Multiple entries are allowed if separated by a space.
	(COLP) XCOL MCID XMCI	CLID Presentation supported. To remove COLP. Allow Malicious Call Trace Remove Malicious Call Trace.
- RCAP	aaaa	Remote capabilities is reprompted to enable the user to enter a <CR>, exiting from this prompt, or to change an existing remote capability value.
...		
ISDN	YES	ISDN.
...		
- TIMR	YES	Change programmable timers. Only supported for interfaces supporting one of the prompted timers.

Prompt	Response	Comment
- - INC_T306	0-(120)-240	Variable timer, in seconds, for received DISCONNECT message on incoming calls allowing in-band tone to be heard. The network will stop sending after this timer times out. The value is stored in two-second increments, which are rounded up.
- - OUT_T306	0-(120)-240	Variable timer, in seconds, for received DISCONNECT message on outgoing calls allowing in-band tone to be heard. The network will stop sending after this timer times out. The value is stored in two-second increments, which are rounded up.
...		
MCTS	YES	Enable MCT signaling.
...		
- MCTM	(0)-30	Malicious Call Trace disconnect delay timer (this timer overrides the T306 timer for calls originating or terminating on sets with MCT Class of Service).
- MTND	(NO) YES	(Do not) apply a Malicious Call Trace disconnect delay for tandem calls.

LD 27 - Configure for a Multi-purpose ISDN Signaling Processor (MISP) for an ISDN BRI trunk.

Prompt	Response	Comment
REQ	NEW CHG	Add new data. Change existing data.
TYPE	MISP	Multi-purpose ISDN Signaling Processor.
LOOP	0-158 1-9	MISP loop number (Options 51C-81C). MISP loop number (Option 11C).
APPL	 BRIE	Application type. Enter BRIE for Australia ETSI.
APPL	<CR>	To end configuration procedure.

LD 27 - Configure an S/T Interface (SILC) or U-Interface (UILC) line card, for an ISDN BRI trunk.

Prompt	Response	Comment
REQ	NEW CHG	Add new data Change existing data.
TYPE	CARD	SILC or UILC configuration.
TN		Card location (Options 51C-81C).
	lll	lll (superloop) = 0-156 (must be an even number, divisible by 4)
	s cc	s (shelf) = 0-1 cc (card) = 0-15
		Card location (Option 11C).
	c	c (card) = 1-9
MISP	0-158 1-9	MISP loop number (Options 51C-81C). MISP loop number (Option 11C). Must be an even loop number that has already been configured.
CTYP	SILC UILC	SILC line card is to be added or changed. UILC line card is to be added or changed. ***Note:*** Remove any DSLs configured for this line card before changing the card type.

LD 27 - Configure a Digital Subscriber Loop (DSL) for an ISDN BRI trunk.

Prompt	Response	Comment
REQ	NEW CHG	Add new data Change existing data.
TYPE	DSL	Digital Subscriber Loop data block.

Prompt	Response	Comment
DSL	lll s cc dsl#	DSL Terminal Number location (Options 51C-81C). lll (superloop) = 0-156 (must be zero or a number divisible by 4) s (shelf) = 0-1 cc (card) = 0-15 dsl# (DSL location) = 0-7
		DSL Terminal Number location (Option 11C).
	cc dsl	cc (card) = 1-20 dsl# (DSL number) = 0-7
APPL	BRIE	BRI trunk application for Australia ETSI.
CUST	xx	Customer number, as defined in LD 15. xx = 0-99 (Options 51C-81C). xx = 0-31 (Option 11C).
CTYP	SILC	Interface card type is SILC.
MISP	0-158 0-9	MISP loop number for Options 51C-81C MISP loop number for Option 11C.
MODE	TE	Enter TE (user side) as the mode for Australia ETSI.
- MTFM	(NO) YES	BRI multiframe option.
TKTP	TIE COT DID	TIE trunk type. Central Office Trunk type. Direct Inward Dialing trunk type.
		Must be the same entry as defined in LD 16.
CLOK	(NO) YES	(Do not) use the DSL as the clock source.
PDCA	(1)-16	Pad table number.
ROUT	0-511 0-127	Route number (both B-Channels must belong to the same route) (Options 51C-81C). Route number (both B-Channels must belong to the same route) (Option 11C).
TIMR	(NO) YES	(Do not) change timer values.

Prompt	Response	Comment
- - T310	(30)-100	Maximum time in seconds between an incoming CALL PROCEEDING message and the next incoming message.
B1	(NO) YES	(Do not) change the configuration parameters for B-Channel 1.
- MEMB	1-510	Route member number.
...		
B2	(NO) YES	(Do not) change the configuration parameters for B-Channel 2.
- MEMB	1-510	Route member number, for Options 51C-81C.
...		

LD 27 - Assign meters to a DSL (this step is required for Advice of Charge). The MR/PPM package 101 must be equipped on the Meridian 1.

Prompt	Response	Comment
REQ	NEW	Add an ISDN protocol group
TYPE	DSL	LAPD Protocol group
DSL		DSL Terminal Number location (Options 51C-81C).
	lll	lll (superloop) = 0-156 (must be zero or a number divisible by 4)
	s	s (shelf) = 0-1
	cc	cc (card) = 0-15
	dsl#	dsl# (DSL location) = 0-7
		DSL Terminal Number location (Option 11C).
	cc	cc (card) = 1-20
	dsl	dsl# (DSL number) = 0-7
...		
CLS	MRA	Allow Message Registration on the DSL.

LD 16 - Allow Advice of Charge on the route configured for the Australia ETSI.

Prompt	Response	Comment
REQ	NEW	Add new data (ISDN BRI protocol group settings).
TYPE	RDB	Route Data Block.
CUST	xx	Customer number, as defined in LD 15. xx = 0-99 (Options 51C-81C). xx = 0-31 (Option 11C).
ROUT	0-511	Route number, as previously configured (Options 51C-81C).
	0-127	Route number, as previously configured (Option 11C).
TKTP	TIE	TIE trunk type.
	COT	COT Central Office Trunk trunk type.
	DID	Direct Inward Dialing trunk type.

Prompt	Response	Comment
...		
DTRK	YES	BRI Digital Trunk Route
BRIP	NO	ISDN BRI packet handler route (NO is entered, since packet data is not required).
- DGTP	BRI	Digital trunk type.
ISDN	YES	Integrated Services Digital Network.
...		
- IFC	EURO	EuroISDN interface.
- - CNTY	EAUS	Australia ETSI.
...		
CDR	YES	Include AOC information in the CDR ticket.
...		
OAL	YES	CDR on all answered outgoing calls.
- OTL	YES	CDR on all outgoing toll calls.
...		
MR	STAC DURC ENDC	Define AOC at call set-up. Define AOC during the call. Define AOC at end of call.
DSPD	(NO) YES	(Do not) display the charge during the call.
...		
RUCS	0-9999	Route unit cost.

Prompt	Response	Comment
RURC	X Y	Route unit reference cost. Formula is $X*10^{(-Y)}$ where X = 0-9999, Y = 0-3. The default value for X is the value that is entered for RUCS.
RUCF	1 0	Route unit conversion factor. 0 = No conversion is required.
DSPT	0-(10)-60	Charge display timer.
...		

Feature operation

No specific operating procedures are required to use this feature.

Backup D-channel

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Feature description

In order to increase the reliability of the D-channel and enhance the serviceability of the Primary Rate Interface, a second or "backup" D-channel has been implemented.

The Backup D-channel provides redundancy for the D-channel Handler Interface (DCHI). The DCHI provides the signaling and protocol for call set-up, tear down and feature activation. The B-channels can either be PRI B-channels or virtual B-channels using analog or digital trunks with the ISDN Signaling Link (ISL) feature. Because the DCHI is so important to trunking requirements, an additional DCHI can be configured so that automatic switchover to a back-up occurs in case of failure. This configuration requires coordination with the far end to ensure that both ends have backup D-channels configured.

When Back-up D-channel is configured, one D-channel is active and the other one acts as a backup. Should the active D-channel fail, the auto-recovery software first attempts to recover the primary D-channel. If the recovery is successful, the D-channel goes back in operation. If the recovery does not take place, Meridian 1 software switches the D-channel processing to the backup D-channel on another link. If the active back-up D-channel fails after the problem with the primary D-channel has been resolved, the auto recovery software automatically switches back to the primary D-channel. During the switchover procedure, active calls remain intact, transient calls, however, may be dropped.

As an option, when the primary D-channel is brought from the "Released" to the "established" state, automatic changeover back to the primary D-channel can be activated.

The Backup D-channel requires a separate PRI card on another carrier link. For analog ISL applications, a separate circuit card, modem, and cable are required.

> ***Note:*** The backup D-channel must be the same D-channel type as the primary D-channel. That is, both must be configured as either DCHI or MSDL in software.

Operating parameters

There are no operating parameters associated with this feature.

Feature interactions

ISDN QSIG Basic Call

Backup D-channel is not supported on the QSIG interface.

Feature packaging

This feature requires the following packages:

- Integrated Services Digital Network (ISDN) package 145;
- 1.5 Mb Primary Rate Access (PRA) package 146; or
- ISDN Signaling Link (ISL) package 147; or
- 2.0 Mb Primary Rate Interface (PRI2) package 154

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 17 – Change the Configuration Record to define the Backup D-channel.

Use the following procedure to define the Backup D-channel

Note: Basic PRI or ISL administration must be performed before the backup D-channel is defined. Also, the PRI loop must already be defined in Overlay 17.

LD 17 – Change the Configuration Record to define the Backup D-channel.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	CFN	Configuration Record.
ADAN	NEW BDCH x	Add a backup D-channel (also CHG, MOV, and OUT BDCH). x = 0-63
PDCH	0-63	Primary D-channel.
CTYP	DCHI	D-channel interface card.
DNUM	0-15	Device number: physical port (odd) for D-channel on DCH, physical card address for MSDL.
- PORT	0-3	Port number on MSDL card.
RCVP	(NO) YES	Auto-recovery to primary D-channel option.
BCHL	0-159	PRI loop number for back-up D-channel.

Table 26
Recovery to primary D-channel RCVP prompt responses

RCVP = YES	RCVP = NO
primary D-channel up—active backup D-channel up	primary D-channel up—active backup D-channel up
primary D-channel down backup D-channel up—active (see below)	primary D-channel down backup D-channel up—active
primary D-channel up—active backup D-channel up	primary D-channel up backup D-channel up—active

When RCVP is YES, the primary D-channel is down, and the backup D-channel is up, and the following occurs. First the switch tries to re-establish the primary D-channel connection. If this cannot be done successfully, then the backup D-channel is switched in. When the primary D-channel is brought up again, the primary D-channel becomes the active D-channel.

If RCVP is NO and the primary D-channel is down, the backup D-channel remains active when the primary D-channel is brought up. It is important to note that the backup D-channel remains the active D-channel.

Feature operation

No specific operating procedures are required to use this feature.

Basic Call Service

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Feature description

ISDN basic call service provides for the transmission of ISDN calls. Basic call service consists of call-progress signaling, and voice and data transmission.

ISDN PRI basic call service is supported for Meridian 1 to Meridian 1, and Meridian 1 to Central Offices that support AXE-10, Numerous VN2, 1TR6, Japan D70, SwissNet, NEAX-61, SYS-12, Asia Pacific, Australia ETSI, or EuroISDN protocols.

Call progress signaling

ISDN PRI supports 64 Kb/s out-of-band signaling (on the D-channel) to effect:

- call setup
- call tear down
- feature activation
- local-busy and reorder tones (overflow tone is supplied locally)

Both out-of-band signaling messages and in-band audible tones are provided for ringback.

Voice and data transmission

Voice and high-speed data are transmitted over B-channels. Call connections are assigned to these B-channels on a per-call basis. The following modes of voice and data transport are available:

- 64 Kb/s circuit-switched voice and data transmission
- 64 Kb/s packet data transmission (or interfaces that support it)

Numbering plans

Four numbering plans are supported on ISDN PRI:

- Coordinated Dialing Plan (CDP) of 3 to 10 digits
- North American 10-digit numbering plan
- Uniform Dialing Plan (UDP) which includes the Electronic Switched Network (ESN) 7-digit private numbering plan with 3-digit NARS location codes.

Typically, the numbering plan for a private network consists of a 3-digit location code (such as the ESN number) and a 4-digit extension. This allows the same extension to be used for private networks and for Direct Inward Dialing (DID) from the public network.

The following variations apply in the United Kingdom:

- group dialing, a hybrid of the coordinated and uniform plans
- mixed-length CDP network

Operating parameters

There are no operating parameters associated with this feature.

Feature interactions

There are no feature interactions associated with this feature.

Feature packaging

This feature requires the following packages:

- Integrated Services Digital Network (ISDN) package 145;
- 1.5 Mb Primary Rate Access (PRA) package 146; or
- ISDN Signaling Link (ISL) package 147; or
- 2.0 Mb Primary Rate Interface (PRI2) package 154

Feature implementation

There are no specific implementation procedures for this feature.

Feature operation

No specific operating procedures are required to use this feature

B-channel Overload Control

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Regional material statement

This feature is only available in North America. Contact your system supplier or your Nortel Networks representative to verify support of this product in your area.

Feature description

The B-channel Overload Control feature provides a solution to the problem situation of having a high rate of incoming calls from a Central Office over ISDN PRI trunks to busy destinations on a Meridian 1 causing slow dial tone and other realtime overload type problems on the Meridian 1.

Note: An example where this could happen would be where a telemarketing firm advertises a product by giving an 1-800 number. In response to the advertisement, the company receives a burst of incoming calls in a short period of time. Many of the calls may receive busy treatment, and in a busy situation, the Meridian 1 rejects the calls.

The feature delays the release of an ISDN PRI call by using a configurable timer (BCOT) when a call encounters a busy condition. The delay in releasing the seized B-channel prevents a new call from being presented on the same B-channel. This delay cumulatively results in decreasing the incoming call rate, thereby avoiding degradation of real-time response. This delay is applied using ISDN protocol compliant messaging. The delay is in milliseconds, so that it is virtually transparent to the caller.

The value for the B-channel Control timer is configured in Overlay 16, on a per-route basis. Although a value from 0-4000 milliseconds is accepted, a value of 256 is recommended. The entered value is rounded down to multiples of 128. After a value has been entered and rounded down (if necessary), the value is printed on the screen before the next prompt is displayed. For example, if a value of 400 is entered, the system rounds this value down to 384 and prints 384 on the display. The next prompt is then displayed.

After the BCOT timer expires, the normal disconnect sequence will take place and a new call may be presented.

Figure 7 and Figure 8 represent a “before-and-after” representation of the B-channel Overload Control feature application.

Figure 7
Before the B-channel Overload Control Timer has been applied

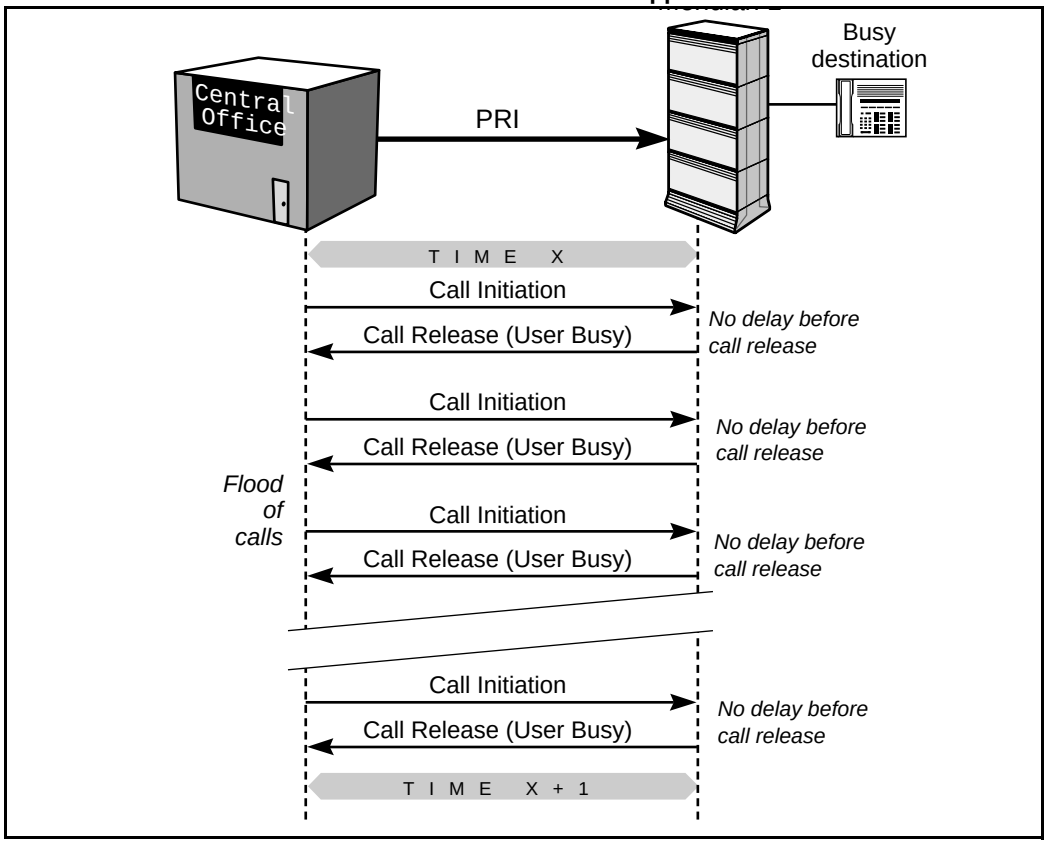
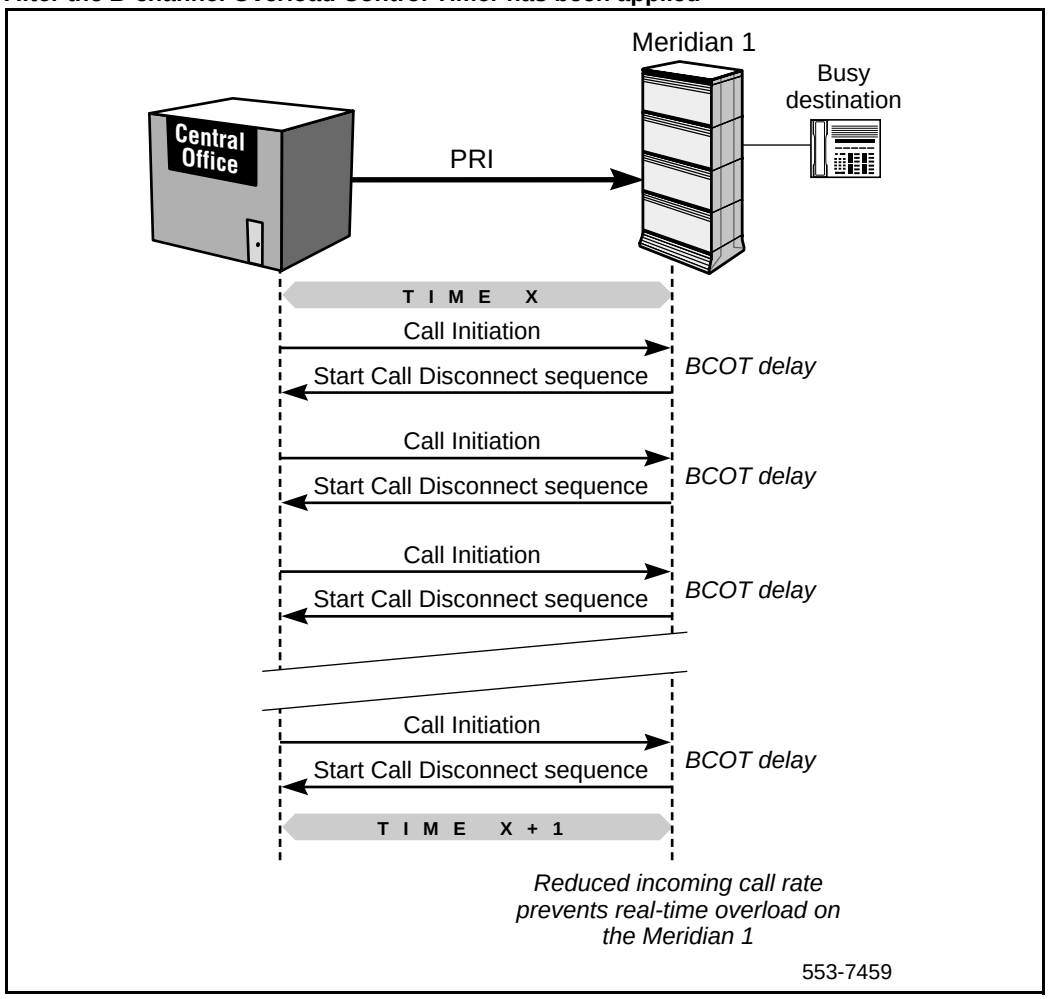


Figure 8
After the B-channel Overload Control Timer has been applied



B-channel Overload Control Timer (BCOT) considerations

Please consider the following pertaining to the application of the BCOT:

- When configuring the BCOT in Overlay 16, the recommended value to be used is 256 milliseconds (most problem scenarios can be solved with this value). Even though the maximum value of 4 seconds may be entered, it is suggested that this value not be used (since callers do not receive any audio feedback while the timer is running, they would receive only silence for four seconds).
- After a value is entered in response to the BCOT prompt in Overlay 16, the system rounds this value down by a multiple of 128 milliseconds, if necessary (the actual time delay is in the range of +0 to -128 milliseconds from the entered value). This value is printed before the next prompt is displayed.
- When a system is upgraded for the first time to a software release containing the BCOC feature, all BCOT timers are initialized to 0.
- By default, the BCOC feature is disabled on all routes (BCOT = 0). To activate the BCOC feature for a route, a service change on the BCOT timer is required using Overlay 16.
- A new Peg counts field for the “Total number of activations of BCOC activations for this route” is added to the TFC002 traffic report. This count will apply to all Meridian 1 routes that interface with DMS, Lucent, and NI-2 TR-1268 switches. For the Integrated Services Access (ISA) Call By Call Type and the NI-2 Call By Call Service Selection features, the peg counts are done against the service routes, and not a master route. The peg count for a master route will always be zero.

  Refer to Tables and Table 28 for a sample traffic measurement report output.

Traffic measurement output

For non-ISA and non-NI-2 Call By Call service routes, the TFC002 traffic measurement report has been updated for the BCOC feature as shown by Table 27.

Table 27
TFC002 format for a non-ISA and non-NI-2 Call By Call routes

System ID	TFC002
...	
Route Number	Route Type
Total number of trunks configured	Total number of trunks working
...	Total number of incoming calls
...	Total number of outgoing calls
...	...
Total number of activations of BCOC for this route	

For ISA and NI-2 Call By Call service routes, the TFC002 traffic measurement report has been updated for the BCOC feature as shown by Table 28.

Table 28
TFC002 format for an ISA service route (Part 1 of 2)

System ID	TFC002
...	
Route Number	Route Type
Total number of trunks configured	Total number of trunks working
...	Total number of incoming calls
...	Total number of outgoing calls
Total incoming calls on the service route	Total outgoing calls on the service route

Table 28
TFC002 format for an ISA service route (Part 2 of 2)

Total number of activations of BCOC for this route

Operating parameters

This feature applies only to the following ISDN PRI to North American Central Office connectivities:

- DMS-100
- DMS-250
- SL-100
- Lucent 4ESS
- Lucent 5ESS and
- National ISDN-2 (NI-2) TR-1268

This feature supports both circuit switched voice and data calls.

This feature does not distinguish between normal busy conditions and overload busy conditions, since its functionality depends on the BCOT value configured at the route level. All busy calls on the route receive the same BCOT treatment.

This feature does not support Virtual Network Services trunks.

This feature is activated for the following call types:

- incoming calls presented on a busy set on a node interfacing directly to a Central Office (see Figure 9 on page 264); or incoming calls from a Central Office being tandemed to a private network and presented on a busy set (see Figure 10 on page 264)
- incoming calls presented on an ACD DN whose ACD queue has reached its maximum limit

- incoming calls presented on a Controlled Directory Number (CDN), and being released by Customer Controlled Routing (CCR) due to a "User Busy" cause
- incoming calls that are tandemed to a route whose trunk members are all busy

Figure 9
Busy set is a on node interfacing directly to a Central Office

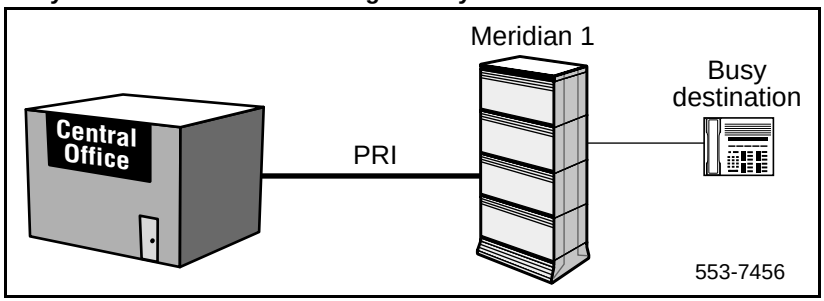
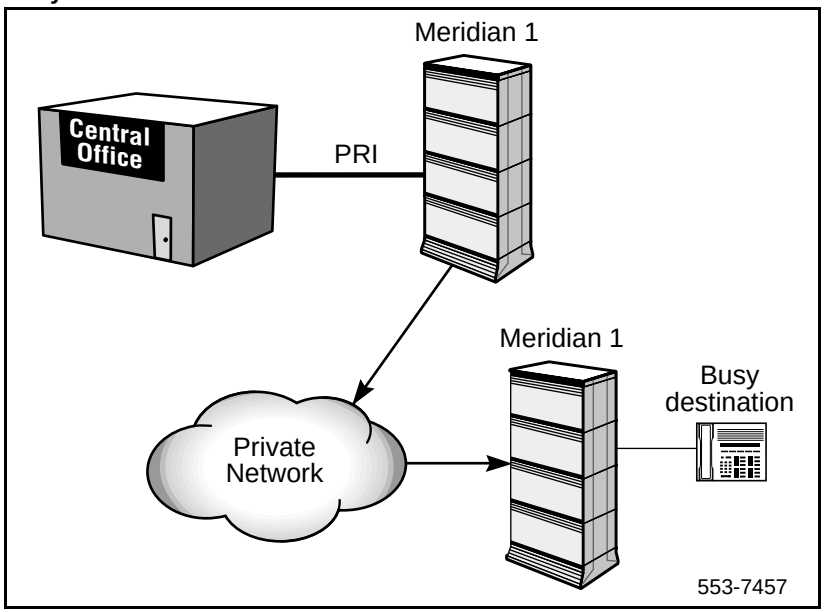


Figure 10
Busy set is a on node tandemed to a Central Office



Feature interactions

Automatic Call Distribution

ACD allows a large volume of calls to be made to the same DN (called the ACD DN), and answered by a group of telephones (called ACD agent positions). Incoming calls are distributed so that the agent that has been idle the longest receives the first call.

Whenever an incoming ACD call gets released immediately due to a “User Busy” cause, the Meridian 1 starts the B-channel Overload Control timer and sends a “Call Proceeding” message rather than releasing the call immediately (the amount of time, in milliseconds, that the B-channel remains seized depends on the value entered for the timer in Overlay 16). After the timer expires, the normal disconnect sequence will take place.

Call Interflow

Call Interflow allows an ACD supervisor to redirect excess traffic to an Interflow DN. All Interflow calls that are to be given busytone will be affected by the B-channel Overload Control feature, in that a delay will be imposed on these calls before the caller receives the busytone.

Enhanced ACD Routing

Enhanced ACD Routing allows different delay treatments to be given to ACD calls from different sources but to the same ACDN DN. Enhanced ACD Routing uses a Control DN, which does not have agent positions but rather specifies a destination default ACD DN to which incoming calls are directed. Multiple Control DNs can place calls into the same ACD queue, so different treatment can be given to these calls (the treatment given to a call is determined by the parameters defined for the Control DN, and not the ACD queue).

The Control DN has a limit to the number of unanswered calls that it can have at its default DN. Once the limit is exceeded, new calls are given busytone and Central Office calls are placed in the ACD queue. These calls that are to receive busytone will be affected by the B-channel Overload Control feature, in that a delay will be imposed on these calls before the caller receives the busytone.

Secondary DN Call Blocking

Secondary DN Call Blocking blocks new incoming ACD calls to the Secondary DN of an ACD agent, so that the agent can handle a current call without interruption. The calls to the Secondary DN receive busytone. These calls that are to receive busytone will be affected by the B-channel Overload Control feature, in that a delay will be imposed on these calls before the caller receives the busytone.

Supervisor Control of Queue Size

Supervisor Control of Queue Size allows ACD DNs busytone to be given to selected call types. These calls that are to receive busytone will be affected by the B-channel Overload Control feature, in that a delay will be imposed on these calls before the caller receives the busytone.

Integrated Services Access

Integrated Services Access (ISA) allows multiple routes to share the same the common pool of B-channels for connectivity between a Meridian 1 PBX and a Central Office PBX such as the DMS-100 and the DMS-250. Unlike dedicated routes, which require each service route to have its own trunks of the same trunk type, ISA trunks are shared among many service routes, which can carry calls of different types that can change on a per call basis.

The B-channel Overload Control feature interacts with ISA in that all incoming calls over an ISA route that are released because of a “User Busy” cause, will be delayed as defined by the B-channel Overload Control timer.

NI-2 Call by Call Service Selection

NI-2 Call By Call Service Selection allows multiple services to share the same the common pool of B-channels for an NI-2 TR-1268 PRI interface. Dedicated routes are not required. The service types can be assigned on a per call basis.

Intercept Treatment

All calls that are released by Intercept treatment due to a “User Busy” cause will be delayed as defined by the B-channel Overload Control timer.

Remote Virtual Queuing

Since Remote Virtual Queuing interworks over a Meridian 1 to DMS interface, the B-channel Overload Control feature imposes a delay on the automatic retry capability of RVQ, which is used when congestion is encountered due to no idle trunks being available.

Auxiliary Products

All calls that interact with the auxiliary products Customer Controlled Routing (CCR), Integrated Call Center Manager (ICCM), and Meridian Link, an that are being released due to "User Busy" cause, are delayed by B-channel Overload Control until its timer expires.

Attendant Blocking of DN

This feature enables the attendant to block calls from being made to a DN while an external call request from that DN is being processed. The blocked calls receive busytone.

The B-channel Overload Control feature interacts with Attendant Blocking of DN in a Meridian 1 to Central Office interface, by imposing a delay on any call coming in from a CO that terminates on a blocked DN and receives busytone treatment due to "User Busy" cause.

Call Connection Restriction

This feature imposes restrictions on a caller's access to the public network, private network, and services and features. If any restriction is detected when a call is attempted, the call is denied and intercept treatment as defined in the Customer Data Block is applied. If the intercept treatment results in the call being released due to a "User Busy" cause, the B-channel Overload Control feature imposes a delay on the release.

Meridian Network Services Drop Back Busy and Off Hook Queue

The B-channel Overload Control feature does not affect the operation of the Drop Back Busy capability. If Off Hook Queuing is active, B-channel Overload Control will not be activated.

Network Individual Do Not Disturb

This feature allows extends the functionality of the Individual Do Not Disturb feature to a network environment. If a DN is in the Do Not Disturb mode, calls may be made from it, but incoming calls to it would receive Intercept treatment. If the treatment is busytone, the B-channel Overload Control feature imposes a delay on the release of these calls.

Trunk Barring

This feature allows customers the option of denying certain types of trunk-to-trunk connections. Attempted calls over these trunks would receive Intercept treatment. If the treatment is busytone, the B-channel Overload Control feature imposes a delay on the release of these calls.

Feature packaging

The B-channel Overload Control feature requires the following packages:

- Integrated Services Digital Network (ISDN) package 145
- 1.5 Mb Primary Rate Access (PRA) package 146

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 16 – Configure the B-channel Overload Control timer (in response to the BCOT prompt).

LD 16 – Configure the B-channel Overload Control timer (in response to the BCOT prompt).

Prompt	Response	Description
REQ	NEW CHG	Add new data Change existing data.
TYPE	RDB	Route Data Block.
...		
ISDN	YES	Integrated Services Digital Network.
...		

- IFC		Supported interface types.
	D100 D250 S100 ESS4 ESS5 NI2	D100 = DMS-100 D250 = DMS-250 S100 = SL100 ESS4 = Lucent 4ESS ESS5 = Lucent E5SS NI2 = National ISDN-2
...		
- - BCOT	(0)-4000	The value for the B-channel Control timer, in milliseconds. This value indicates the delay that the Meridian 1 will impose on a B-channel before starting the disconnect sequence. A value of 256 is recommended. The entered value is rounded down to multiples of 128. After a value has been entered and rounded down (if necessary), the (rounded down) value is autoprinted on the screen before the next prompt is displayed. Refer to “B-channel Overload Control Timer (BCOT) considerations” on page 261 for more information. **Note:** In the case of Integrated Services Access (ISA) Call By Call Type and NI-2 Call By Call Service Selection, BCOT is prompted only for Service Routes.
....		

Note: You may print the BCOT timer value that was entered in LD 16 by using LD 21.

Feature operation

No specific operating procedures are required to use this feature.

Break-in Features

Contents

The following are the topics in this section:

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Break-in busy indication and prevention 272
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Reference list

The following are the references in this section:

- *Features and Services* (553-3001-306)

Feature description

The Break-in (BKI) feature allows an attendant to interrupt an established call in order to connect an important incoming call to one of the established parties. For a description of the basic Break-in feature, refer to *Features and Services* (553-3001-306).

The following sections describe Break-in related features, as applied to an ISDN PRI environment.

Break-in busy indication and prevention

For reasons of confidentiality, some customers may not want to allow Attendant Break-in on external call connections (that is, call connections involving off-network trunks). Alternately, they may require that the attendant be aware that a call connection is external before performing a break-in.

This feature provides two options, described below. Either option can be selected for a customer, but not both.

Break-in busy indication

With the Break-In Busy Indication option, if an attendant dials a busy extension during a break-in operation the attendant display provides one of two customer-defined indications:

- three dashes, appended to the end of a set of displayed digits, if the busy station is involved in an external call (this is the BBIN option), or
- a mode digit, appended to the end of a set of displayed digits (this is the EBIN option)

In an ISDN PRI environment, the mode digit indicates one of these states:

1 = Station is busy on an off-net call, or involved in a conference call.

2 = Station is busy with on-net call, and is not involved in a conference call.

3 = Station is busy on a non-established call; for instance, dialing, ringing, or announcement.

4 = Station is in line lockout.

Break-in prevention

With the Break-In to External Call Denied option (BIXD option), break-in to a party involved in an external call is temporarily denied. This applies to both pre-dial and post-dial break-in operations.

Break in with secrecy

The Break In With Secrecy (BKIS) feature enhances the operation of the Break In (BKI) feature. With BKIS, when the break-in conference is established between the attendant and the desired and undesired parties of a call, the attendant may press the BKI key again to exclude the undesired party and talk directly to the desired party. Once the undesired party is excluded, intrusion tone is no longer provided.

BKIS applies to both predial and post-dial Break-in operations. In a post-dial situation, the attendant dials the desired party before pressing the BKI key. Whereas in a predial case, the attendant presses the BKI key prior to dialing the digits of the desired party.

BKIS operates in both stand-alone and within an Meridian Customer Defined Network (MCDN) Integrated Services Digital Network (ISDN) environment. In a MCDN ISDN environment BKIS is an enhancement of Network Attendant Service (NAS) Break-in (BKI), described in the NAS description found later in this document.

Operating parameters

The operating parameters which apply to the Break-In feature and the Network Attendant Service Break-In feature also apply to this feature.

Indication of station status on a call to a busy station is available only on Attendant Consoles.

Break-in with secrecy

The same feature requirements apply as for the Break-in feature. Within an ISDN environment:

- All conditions for NAS Break-in must be met.
- In order for this feature to operate correctly over the network, all nodes connected to the attendant must have Break-in software equipped.

Feature interactions

Feature interactions for the Break-In and Network Attendant Service Break-In features also apply to this feature.

With the Break-In to Line Lockout Set product improvement, the appropriate busy indication is supported. If the Break-In to Line Lockout Set Denied option (option BLD) was set for the customer, attempts at break-in results in Temporarily Denied—1 status. If the Break-In to Line Lockout Set Allowed option (option BLA) was set then break-in proceeds normally. If the Attendant Busy Display Allowed option of the First-Second Degree Busy Indication feature is chosen in overlay 15 (option ABDA), display of digits could be changed. When the attendant dials a second-degree busy station, the attendant digit display shows **—0**. In combination with the Break In Indication and Prevention feature, the display may show **—0**——— or **—0** followed by another dash and a mode digit.

Break-in with secrecy

Other than the interactions described below, the Feature interactions are the same as for the Break-in and NAS Break-in features.

Break-in to Enquiry Calls

Break-in with Secrecy interacts with Break-in to Enquiry Calls (BIEC) when the desired party has gone on-hook leaving an undesired party off-hook and excluded. BIEC has enhanced the existing BKI feature by giving overflow tone to the undesired party if it is a 500 type set (irrespective of whether the undesired party was involved in an enquiry call or not). BKIS does not change this operation for non-BKIS calls.

BKIS has a choice of options to be given to the undesired party if the desired party goes on-hook while the undesired party is excluded. These are taken from the AOCS options in the Customer Data Block. These options are not given to the undesired party if the undesired party has a call on hold, this only applies to analog (500/2500 type) sets. The BIEC treatment of giving overflow tone is done instead so that the undesired party can be reconnected to the held party.

Therefore, it is quite possible for PBX-type sets and trunks to get different treatment depending on the circumstances.

The following is a list of treatments for different circumstances:

- Existing BKI BIEC disconnects undesired parties when the desired party goes on-hook, except for analog (500/2500 type) sets where overflow is given. Therefore Meridian digital and SL-1 sets and trunks are disconnected.
- BKIS will give either overflow, transfer to attendant, or disconnect treatment to analog (500/2500 type) sets or trunks. Meridian digital and SL-1 sets are disconnected.

Multi-Party Operation

For Multi-Party Operation (MPO), the operation of features, such as going on-hook and releasing from a call, during the BKIS conference between the attendant and the desired party, takes precedence over MPO operations for those cases where the treatment differs from that defined by the customer.

All network nodes must have MPO software, with identical Multiple-party Operation (MPO) options. Otherwise, MPO options in the desired party's node have precedence.

Pertaining to MPO options, if the undesired party is not located on the same node as the desired party, the undesired party is considered as an external party on the desired party node.

Network Attendant Service (NAS)

The BKIS feature operates in a networking environment with regard to the NAS Break-in Feature operations and limitations.

Secrecy

The source and destination parties cannot be joined together on the attendants conference bridge if BKIS is active. This is consistent with the existing Break-in feature.

Music

During secrecy, if there is only one undesired party in the conference, music is not provided to this party when excluded. However, intrusion tone is given to this party.

Display

In all cases, when displays are equipped, the information displayed is consistent with current operation (i.e., when connected to only one party, the display shows the number and name, if equipped and configured, of that party, and when connected to more than one party, the display is blank).

Feature packaging

The following package is required for Break-in features:

- Attendant Break-in/Trunk Offer (BKI) package 127.

For an ISDN network environment, the following software packages are required:

- Integrated Services Digital Network (ISDN) package 145;
- Network Attendant Service (NAS) package 159; and
- Integrated Services Digital Network Supplementary Features (ISDNS) package 161.

Break-in with secrecy

Break-in with Secrecy requires Attendant Break-in (BKI) package 127.

For an MCDN ISDN environment, the following packages are required:

- ISDN basic (ISDN) package 145;
- Network Attendant Service (NAS) package 159; and
- ISDN Supplementary Features (ISDNS) package 161.

Multi-Party Operations (MPO) package 141 is optional, but if used in an MCDN ISDN environment all nodes must be equipped with the MPO package.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 15 – Configure Customer Data Block for Break-In features.

2 LD 12 – Modify or create Attendant Console data blocks.

3 LD 15 - Modify Multi-Party Operations data in Customer Data Block if MPO package 141 is equipped.

4 LD 20 – When the Attendant Console data block is printed the BKI key information is output.

5 LD 21 – When the Customer data block is printed all Multi-Party Operations options are output.

LD 15 – Configure Customer Data Block for Break-In features.

Prompt	Response	Description
REQ:	CHG	Change existing data block.
TYPE:	FTR	Features and options.
CUST	xx	Customer number.
...		
OPT	(BIXA) BIXD (BIND) BBIN EBIN	Break-In to external call Allowed. Break-In to external call Denied. Break-In Indication Denied. Basic Break-In Indication. Extended Break-In Indication.

Break-in with secrecy

LD 12 – Modify or create Attendant Console data blocks.

Prompt	Response	Description
REQ	CHG NEW	Request: Create or modify data block.
TYPE	aaaa	Type of console, where aaaa = 1250 for M1250 console, 2250 for M2250 console, ATT for QCW3, QCW4 console, or PWR if the TN is used for power or Attendant Supervisory Module ASM.
...		
AADN	...	

KEY ...	0-19 BKI	Key number assigned to Break-in.

LD 15 - Modify Multi-Party Operations data in Customer Data Block if MPO package 141 is equipped.

Prompt	**Response**	**Description**
REQ:	CHG NEW	Request: Modify or create data block.
TYPE:	MPO	Multi-Party Operations.
CUST	xx	Customer number.
...		
- FMOP	(NO) YES	Flexible Misoperation Options.
- - RGNA	xxx yyy	Ringing No Answer treatment
- - AOCS	xxxyyy AAR AAR ATN(ATN) DAR DAR (DIS) DIS OVF OVF STD STD	All Other Cases where: the first field (xxx) defines treatment for internal calls and the second field (yyy) defines the treatment for external calls. AAR – The transferring station is re-rung. If the transferring station fails to answer, the transferred station is routed to the attendant. ATN – Attendant DAR – The transferring station is re-rung. If the transferring station fails to answer, the transferred station is disconnected. DIS – Disconnect OVF – Overflow STD – Standard
- - RCY1	1-(6)-15	Number of Cycles of Re-ringing before forwarding or disconnecting

- - RCY2	1-(4)-15	Number of Cycles of Ringing before forwarding to transferring station
- - ACNS	(NO) ALL EXT	Attendant Clearing during Night Service
- - RALL	(NO) YES	Mandatory recall is required prior to dialing control digits
- - CDTO	2-(14)	Control digit timeout; in multiples of two seconds
...		

LD 20 – When the Attendant Console data block is printed the BKI key information is output.

Prompt	Response	Description
REQ	PRT	Request: Print data block.
TYPE	xxxx	Type of data block.
...		

LD 21 – When the Customer data block is printed all Multi-Party Operations options are output.

Prompt	Response	Description
REQ	PRT	Request: Print data block.
TYPE	CDB	Type of data block: Customer Data Block.
CUST	xx	Customer number.

Feature operation

There are no operating procedures specified for regular Break-in features.

Break-in with secrecy

Break-in to two-party connection

The following sections describe a post-dial Break-in. For predial Break-in, Break-in is done on the Source of the attendant and there is no party A calling the attendant, but the BKIS operation is identical.

The scenario is as follows:

> Party A calls the attendant, the attendant calls party B who is talking to party C. The attendant presses the BKI key to intrude into the conversation. At this point, the attendant and both parties B and C are in conversation with intrusion tone provided, while party A is on HOLD (with music if EMUS, package 119, is equipped).

Break-in "Allowed"

This situation will arise when party A is an external call and Camp-on or Call Waiting is possible at the wanted station B. At this point, the BKI, Exclude Source (EXCL SRC) and Exclude Destination (EXCL DEST) indicators are active (lamps are lit or Liquid Crystal Display [LCD] is on), and the following actions can occur:

Request the unwanted party to terminate

The attendant may request the unwanted party to terminate. A positive response will terminate the conference that included the attendant and intrusion tone. This is a current BKI operation.

Request the wanted party to terminate

The attendant may request the wanted party to terminate the call. The party disconnects, terminating the BKI conference. This is a current BKI operation.

Attendant presses Release Destination key

The attendant may press the RLS DEST key to release the call. This action terminates the conference and the original call is reestablished as it was prior to Break-in. The Source party A is connected to the Attendant. This is a current BKI operation.

Attendant presses Exclude Destination key

The attendant may press the EXCL DEST key to return to the incoming call. The intruded parties keep receiving the intrusion tone. This is a current BKI operation.

Attendant presses Release key

The attendant may press the Release (RLS) key to apply Camp-on. This is a current BKI operation.

Attendant presses Break-in key again

The BKIS feature allows the attendant to press the BKI key ***again*** in order to exclude the undesired party C (who continues to hear intrusion tone) and to talk directly to the desired party B without intrusion tone. The BKI indicator, which was active, flashes at 60 impulses per minute (ipm).

> ***Note:*** Pressing of the BKI key a second time with the Break-in conference excluded will not activate secrecy (i.e., if the Break-in conference is on the destination but the attendant is talking on the source, secrecy cannot be activated).

From this point, the following attendant operations can occur:

Attendant actions

Break-in

The attendant presses the flashing BKI key. In this case, party C**,** which was excluded, is brought back into conversation with the attendant, party B, and intrusion tone. The BKI indicator reverts to an active state. The situation reverts to a normal BKI conference with intrusion tone.

In other words, the lit BKI key can be used to exclude the unwanted party from the BKI conference and the flashing BKI key can be used to reestablish the BKI conference (with intrusion tone).

Exclude Destination

The attendant presses the EXCL DEST key to return to the incoming call. The attendant is connected to the source party. The unwanted party B and the wanted party C are reconnected with intrusion tone. The EXCL SRC indicator is now off and the EXCL DEST lamp and the BKI indicators are active. The operation of the EXCL DEST key has the same effect as for a normal BKI conference situation, as described previously.

Release

The attendant presses the RLS key to apply Camp-on. If Camp-on or Call Waiting is available, parties B and C are reconnected and party A is released and either Camp-on or Call Waiting is applied to the wanted party A. The BKI indicator is off. If Camp-on or Call Waiting is not available, the operation of the RLS key causes secrecy to be turned off and the situation to go back to the Break-in conference with intrusion tone. The loop can only be released by pressing the RLS DEST key, leaving the source connected to the attendant. The operation of the RLS key has the same effect as for a normal BKI conference situation, as described previously.

Release Destination

The attendant presses the RLS DEST key. The BKI, EXCL SRC, and EXCL DEST indicators are off and party A is connected to the attendant. Party B (desired) and party C (excluded party) are reconnected.

Undesired party action

Party C (undesired party) goes on-hook and is disconnected. Then the BKI indicator goes off and the attendant treats the call as a normal two-party connection. The attendant is talking directly to party B (desired party) and can press the RLS key to extend the call.

Desired party action

At this point, if party B (controlling party) goes on-hook, the treatment depends upon the Customer Data Block (LD 15) Multi-party Operations (MPO) Flexible Misoperation Options (FMOP) All Other Cases (AOCS) settings if the undesired party is a trunk or 500-type set and MPO package 141 is equipped. If the MPO package is not equipped, internal calls will be disconnected, while external calls will be rerouted to the attendant.

The following shows what happens to 500-type sets or trunks depending on the AOCS options:

AOCS set to AAR for party C

If AOCS is set to AAR for party C, then party C is routed to the attendant and party B is re-rung by the attendant. BKI indicator goes off and a simple call is set up between attendant and party B when B answers.

AOCS set to ATN for party C

If AOCS is set to ATN for party C, then party C is routed to the attendant while B is re-rung by the attendant. The BKI indicator goes off and the attendant hears ring back and the DEST indicator winks at 30 ipm. The attendant can extend the call as normal.

AOCS set to DAR for party C

If AOCS is set to DAR for party C, then party C is disconnected and party B is re-rung by the attendant. The BKI indicator goes off and when B answers a simple call exists between the attendant and party B.

AOCS set to DIS for party C

If AOCS is set to DIS for party C, then C is disconnected and party B is re-rung by the attendant. The BKI indicator goes off and the attendant hears ringback and the DEST indicator winks at 30 ipm. The attendant can then extend the call as normal.

AOCS set to OVF for party C

If AOCS is set to OVF then overflow tone is given to party C and party B is re-rung by the attendant. The BKI indicator goes off, the attendant hears ringback, and the DEST indicator winks at 30 ipm. The attendant can then extend the call as normal.

AOCS set to STD for party C

If AOCS is set to STD for party C, the treatment is the same as default for the AOCS option. If party C is internal, then DIS option applies to party C, and if party C is external, then ATN option applies to party C.

Break-in 'Consultation Only'

This console state indicates that the attendant has been allowed to Break-in to the desired party's call; however, the attendant will not be able to extend the originating call. This situation will occur under any of the following conditions:

1 An internal call is on the source port of the Attendant Console.

2 The attendant originated the call. In this case, the source indicator will be used instead of the destination indicator to provide status information (predial situation).

3 An external call is on the source and neither Camp-on nor Call Waiting is possible at the wanted station (i.e., Camp-on or Call Waiting not possible or the station already has a call camped on).

4 The desired station is busy with Call Forward active and the attendant initiated a predial Break-in.

The BKI and the EXCL SRC indicators are active, the DEST indicator is flashing. At this point, the attendant is not allowed to press the RLS key to extend the originating call, party A. The operation of the RLS key is ignored. This is a current BKI operation.

The attendant may press the BKI key to exclude party C and talk directly to party B, as described under the Attendant actions section. The BKI and DEST indicators are flashing. While in this state, the attendant is not allowed to press the RLS key to extend the originating call, party A. The operation of the RLS key causes the secrecy to be turned off and the situation to revert to a Break-in conference. The other operations described in the Attendant actions section are available.

Break-in to a conference

Party A (either internal or external) calls the attendant, the attendant calls party B who is involved in a conference call with parties C and D. The attendant presses the BKI key to intrude into the conversation. At this point, the attendant, party B and all the original conferees are in conversation with intrusion tone provided, while party A is on HOLD. The BKI and EXCL SRC indicators are active. The DEST indicator is flashing and the BKI status is 'Consultation Only'.

At this point, the attendant may press the BKI key to talk directly to party B without intrusion tone. The Break-in indicator flashes at 60 ipm. The original conference is excluded from party B (the other parties in the conference remain connected without intrusion tone). Party A is still excluded on the attendant loop and the attendant is talking directly to party B without intrusion tone.

While in this state, the following situations can occur:

Attendant actions

Break-in

The attendant may press the flashing BKI key. The original conference is reestablished with intrusion tone. The BKI indicator reverts to active.

Exclude Destination

The attendant may press the EXCL DEST key to return to the incoming call. The original conference is reestablished and party A is connected to the attendant.

Release

The attendant is not allowed to extend the original call to the wanted party B by pressing the RLS key. The operation of the RLS key causes the secrecy to be turned off and the situation reverts to a Break-in conference.

Release Destination

The attendant may press the RLS DEST key. The BKI, EXCL SRC and EXCL DEST indicators are off and party A is reconnected to the attendant. The original conference (B, C, and D) is reestablished.

Undesired party action

All but one of the conferees (C or D) go on-hook. The last undesired party will start getting the intrusion tone once again. The situation reverts to the previously described operation (See “Undesired party action” on page 282).

Desired party action

At this point, if party B goes on-hook, party B is re-rung by the attendant and the conferees are left in conference without party B and without intrusion tone. The BKI indicator goes off, the attendant hears ringback tone, and the DEST indicator winks at 30 ipm. The attendant can extend the call as normal.

Table 29
Summary of possible Break-in situations and indications (Part 1 of 2)

State	Operation	SRC or DEST Indicator	Break-in Indicator	Tone
1Allowed	a) post-dial	ACTIVE	ACTIVE	intrusion
	predial	ACTIVE	ACTIVE	busy
	b) post-dial	ACTIVE	OFF	none
	predial	ACTIVE	ACTIVE->OFF	override
2Consultation Only	a) post-dial	FLASH	ACTIVE	intrusion
	b) predial	FLASH	ACTIVE	busy
3Temporarily Denied 1		FLASH	FLASH	busy override if override is involved
4Temporarily Denied 2	a) post-dial only	FLASH	WINK	overflow
	b) predial	FLASH	WINK	busy or ring back
	(then post-dial)	FLASH	WINK	intrusion
5Denied		FLASH	OFF	overflow
6Break-in	a) post-dial	WINK	OFF	ringback

Table 29
Summary of possible Break-in situations and indications (Part 2 of 2)

7Ignored station is rung	b) Predial	WINK	OFF	ringback
8Invalid	post-dial or predial	OFF	OFF	overflow
9Break-in with Secrecy	after post-dial or predial, active BKI key is pressed	ACTIVE or FLASH	FLASH	no tone

Table 30
Summary of possible Break-in situations and actions

Condition of called DN	Action
1Established call, Call Waiting or Camp-on allowed, Multiple Appearance DN.	Break-in allowed, connection established.
2Lockout (if not denied).	Connection is made.
3Attendant dialing on SRC, internal call on SRC, CWT or Camp-on not available, desired party in conference, Call Forward active on set.	Connection is made for the attendant only.
4Tones, ringing, dialing, blocking, Override, Camp-on, Hold, talking to another attendant, Call Transfer, WTD on undesired party.	Release DEST, wait and repeat.
5Make Set Busy, Do not disturb.	Predialing operation possible.
6Warning tone denied on desired party, maintenance busy.	Break-in impossible.
7Station is idle.	Station is rung, station not affected.
8Invalid numbers.	Break-in impossible.
9The previous status was 'Allowed' or 'Consultation Only'. SRC or DEST indicator was active ('Allowed') or flashing ('Consultation Only').	Undesired party is excluded and the attendant is talking to the wanted party.

BRI/PRI Basic Call Interworking

Contents

The following are the topics in this section:

Feature description 289
Operating parameters 290
Feature interactions 291
Feature packaging 291
Feature implementation 292
Task summary list 292
Feature operation 292

Feature description

BRI/PRI Basic Call Interworking provides data connectivity between ISDN BRI and ISDN PRI. It does the following:

- allows better high- and low-level compatibility checking between the calling and terminating equipment
- supports the V.120 protocol between BRI TEs over PRI
- supports a greater range of Bearer Capability, which is the network data transmission rate
- allows end users to support many terminals on the same BRI DSL, such as Group IV fax, data monitor
- propagates existing IEs with existing encodings over tandem PRIs between BRI TEs

The affected IEs are:

- Bearer Capability
  BRI and PRI propagate octet 4ab without modification.
- Called party subaddress
  Meridian 1 decodes and saves the called party subaddress when it is received from PRI, passing it to the terminating BRI. The system also sends the subaddress to PRI when the originating BRI or PRI includes it.
- Calling party subaddress
  Meridian 1 decodes and saves the calling party subaddress when it is received from PRI, passing it to the terminating BRI. The system also sends the subaddress to PRI when the originating BRI or PRI includes it.
- Cause
  BRI and PRI propagate octet 4 without modification.
- High layer compatibility
  Meridian 1 decodes and saves high-layer compatibility information received from PRI and passes it to the terminating BRI. The system also sends the information element, without interpreting it, to PRI after receiving it from the originating BRI or PRI.
- Low layer compatibility
  Meridian 1 decodes and saves low-layer compatibility information received from PRI and passes it to the terminating BRI. The system also sends the information element, without interpreting it, to PRI after receiving it from the originating BRI or PRI.

BRI/PRI supports these interfaces:

- Meridian 1 PRI
- Japan D70 PRI
- 4ESS and 5ESS PRI

Operating parameters

New IEs and IEs with new encodings are only supported when the RCAP is configured in LD 17. Existing IEs and encodings are supported end-to-end regardless of the RCAP value.

A call with new Bearer Capability encodings will only terminate to a BRI terminal. If the terminating terminal is not a BRI terminal, the call is blocked.

Voice calls are successful between BRI and PRI with no restrictions.

Feature interactions

The following feature interactions are unique to BRI/PRI basic data call interworking.

- ISDN BRI Data Call
  Added IEs (such as LLC and HLC) and the expanded set of supported data values for the Bearer Capability IE enhance BRI's ability to support a variety of circuit switched data calls.
- ISDN PRI D-channel Error Reporting and Monitor
  The DCH table supports the new IEs in the PRI call messages. The DCH monitor displays the new IEs and a label for monitor level 2.
- Incoming Digit Conversion
  If an incoming SETUP message with the new Bearer Capability encodings goes through incoming digit conversion, it must be translated to a BRI DN. If the terminating DN is not a BRI DN, the call will be blocked.
- Network Alternate Route Selection
  If an outgoing call contains a SETUP with a new Bearer Capability encoding, it can only be terminated on PRA/ISL trunks with RCAP configured. This means that at least one entry in the RLB must be PRA/ISL and have the DCH RCAP configured for BRI. NARS will continue to search the RLB until it finds RCAP=BRI. An outgoing call is blocked if RCAP is not configured, or if all trunks with RCAP configured are busy.

Feature packaging

BRI/PRI, as a feature, has no packaging requirements. However, the requirements for ISDN BRI and ISDN PRI must be met.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 17 – Configure far-end BRI support

2 LD 22– Print the configuration record

LD 17 – Configure far-end BRI support

Prompt	Response	Description
REQ	CHG	Change system data
TYPE	CFN	Configuration record
ADAN	CHG DCH X	
..		
RCAP	BRI XBRI	Add far-end BRI support Remove far-end BRI support
		Valid only for IFC=SL1, D70, ESS4, ESS5

LD 22– Print the configuration record

Prompt	Response	Description
REQ	PRT	Print system data
RCAP	BRI	Far-end BRI support
		Valid only for IFC=SL1, D70, ESS4, ESS5

Feature operation

This feature operates in the background according to how the BRI TEs are configured and the RCAP value in LD 7.

BRI Trunks with Night Service Enhancement

Contents

The following are the topics in this section:

Feature description 293
Operating parameters 295
Feature interactions 296
Feature packaging 296
Feature implementation 296
Task summary list 296
Feature operation 299

Reference list

The following is the reference in this section:

- Night Service and Night Service Enhancements feature modules in *X11 Features and Services* (553-3001-306)

Feature description

Succession Communication Server for Enterprise (CSE) 1000 Release 1.1 supports ISDN Basic Rate Interface (BRI).

ISDN BRI consists of two 64Kb/s Bearer (B) channels, and one 16Kb/s Data (D) channel. The BRI interface is referred to as a 2B+D connection as well as a Digital Subscriber Loop (DSL).

B-channels transmit user voice and data information at high speeds, while D-channels are packet-switched links that carry call set-up, signaling and other user data across the network.

One single DSL can carry two simultaneous voice or data conversations, to the same or to different locations. In either case, the D-channel can also be used for packet communications to a third location simultaneously. The two B-channels can also be combined for transmitting data at uncompressed speeds of up to 128 Kb/s.

A wide range of devices and telephone numbers can be associated with a single DSL, to offer equipment flexibility and reductions in line, wiring and installation costs.

Night Service Enhancement for BRI Trunks

Night Service Enhancement for BRI Trunks enhances the functionality of the Night Service feature. Night Service allows calls that are normally directed to the attendant to be routed to another defined destination. With the Night Service Enhancement for BRI Trunks feature, a Night Service DN (NITE) or Night Service Group number (NGRP) can be defined for BRI trunks.

The Night Service Enhancement for BRI Trunks feature introduces the NITE and NGRP prompts for Overlay 27.

The NITE prompt appears in Overlay 27 when the following conditions apply:

- Enhanced Night Service is disabled (ENS = NO) in Overlay 15.
- Auto Terminate is disabled (AUTO = NO) in Overlay 16.
- The BRI trunk is defined as a Direct Inward Dialing (DID) or Central Office (COT) trunk in Overlay 27.

The NGRP prompt appears in Overlay 27 when the following conditions apply:

- Enhanced Night Service is enabled (ENS = YES) in Overlay 15.
- Auto Terminate is disabled (AUTO = NO) in Overlay 16.
- The BRI trunk is defined as a DID or CO trunk in Overlay 27.

The Auto Terminate DN (ATDN) prompt appears in Overlay 14 when the following conditions apply:

- Auto Terminate is enabled (AUTO = YES) in Overlay 16.
- The BRI trunk is defined as a DID, CO, or TIE trunk in Overlay 27.

  Note: In this case, neither the NITE prompt nor the NGRP prompt appears in Overlay 27.

Operating parameters

Support for ISDN BRI applies to Succession CSE 1000 Release 1.1 and later.

Succession BRI connectivity supports two interface standards:

- S/T Interface Line Card (SILC)
- U Interface Line Card (UILC)

The S/T Interface Line Card (SILC) and the U Interface Line Card (UILC) can reside in Media Gateway and Media Gateway Expansion.

With the Night Service Enhancement feature, you can enter a Group Hunt Pilot DN as the Night Service DN.

You cannot assign a BRIL DN to the night station.

The Night Service DN defined in Overlay 27 takes precedence over the Customer Night DN defined in Overlay 15.

The NITE or NGRP prompt appears for each B-channel. You can enter different Night DNs for each B-channel.

If you enter B2 = NO for the configuration of the second B-channel, the Night DN or Night Service Group number that you entered for the first B-channel (BI) is used.

If the definition for the ENS prompt is changed from NO to YES while Night Service is in effect, the system verifies that the Night number defined is a group number or a DN. If a Night DN or 0000 is defined, the existing Night DN, defined in Overlay 15, is used.

Feature interactions

For line access, Succession BRI is compliant with CCITT, ANSI, ETSI NET-3 (EuroISDN), INS NET-64 (Japan D70), National ISDN-1, 1TR6, Numeris VN2, and EuroISDN standards.

Succession BRI trunks connect to local exchanges that support Numeris VN3, 1TR6, ETSI NET-3 (EuroISDN), INS NET-64 (Japan D70), and Asia-Pacific protocols.

For Night Service and Night Service Enhancements feature modules refer to *X11 Features and Services* (553-3001-306) for feature interactions.

Feature packaging

The Night Service Enhancement for BRI Trunks feature requires the following packages:

- Enhanced Night Service (ENS) package 133, in order for the NGRP prompt to appear
- Integrated Services Digital Network (ISDN) package 145
- Primary Rate Access (PRA) package 146
- 2.0 Mb/s Primary Rate Interface (PRI2) package 154
- International Primary Rate Access (IPRA) package 202
- Basic Rate Interface (BRI) package 216
- Integrated Services Digital Network Basic Rate Interface Trunk Access (BRIT) package 233
- Basic Rate Interface Line Application (BRIL) package 235

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 27 - define a Night Service DN when ENS is disabled in Overlay 15.

2 LD 27 - define a Night Service Group number when ENS is enabled in Overlay 15.

LD 27 – Define a Night Service DN when ENS is disabled in Overlay 15.

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	DSL	Digital Subscriber Loop Data Block
DSL	c dsl	Digital Subscriber Loop address
APPL		Application type for this DSL
	BRIE	Basic Rate Interface protocol engine BRIE supports the QSIG and EuroISDN interfaces, and requires BRIT package 233. Any changes in the DSL route must match the BRIE loadware application.
	BRIT	Basic Rate Interface Trunk BRIT supports SL-1, Numeris, and ITR6 interfaces. BRIT package 233 is required.
...		
TKTP		Trunk Type
	DID COT	Direct Inward Dialing trunk type Central Office trunk type
PRID	1 - 4	Protocol ID
PDCA	1 - 16	Pad Category table, as defined in Overlay 73
ROUT	0 -511	Route number for the Trunk DSL.
...		
B1	YES	Change B-channel 1 configuration

Prompt	Response	Description
NITE	x...x	Night Service Directory Number This DN can have up to four digits, or up to seven digits with Directory Number Expansion (DNXP) package 150. You can enter a Group Hunt Pilot DN at this prompt. The DN that you enter here takes precedence over the NITE and NIT1-NIT4 prompts in LD 15. If you enter a DN at this prompt, calls will go to this DN. If you do not enter a DN at this prompt, calls will go to the DNs defined at the NITE prompts in LD 15.
TGAR	0-(1)-31	Trunk Group Access Restriction number
...		
B2	YES	Change B-channel 2 configuration
NITE	x...x	Night Service Directory Number This DN can have up to four digits, or up to seven digits with Directory Number Expansion (DNXP) package 150. You can enter a Group Hunt Pilot DN at this prompt. The DN that you enter here takes precedence over the NITE and NIT1-NIT4 prompts in LD 15. If you enter a DN at this prompt, calls will go to this DN. If you do not enter a DN at this prompt, calls will go to the DNs defined at the NITE prompts in LD 15.

LD 27 – Define a Night Service Group number when ENS is enabled in Overlay 15.

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	DSL	Digital Subscriber Loop Data Block
DSL	c dsl	Digital Subscriber Loop address

Prompt	Response	Description
APPL		Application type for this DSL
	BRIE	Basic Rate Interface protocol engine BRIE supports the QSIG and EuroISDN interfaces, and requires BRIT package 233. Any changes in the DSL route must match the BRIE loadware application.
	BRIT	Basic Rate Interface Trunk BRIT supports SL-1, Numeris, and ITR6 interfaces. BRIT package 233 is required.
...		
TKTP		Trunk Type
	DID COT	Direct Inward Dialing trunk type Central Office trunk type
...		
B1	YES	Change B-channel 1 configuration.
NGRP	0 - 9	Night Service Group number The NGRP prompt replaces the NITE prompt when ENS = YES in LD 15.
TGAR	0-(1)-31	Trunk Group Access Restriction number
...		
B2	YES	Change B-channel 2 configuration.
NGRP	0 - 9	Night Service Group number The NGRP prompt replaces the NITE prompt when ENS= YES in LD 15.

Feature operation

Refer to the Night Service and Night Service Enhancements feature modules in *X11 Features and Services* (553-3001-306) for Night Service and Night Service Enhancements feature operation.

Business Networking Express/EuroISDN Call Diversion

Contents

The following are the topics in this section:

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- Rerouting 305
- Class of Service 306
- Multiple Diversions 308
- Procedures for interworking with private ISDNs 309
- QSIG, MCDN and DPNSS Gateways 316
- Message mapping for rerouting method 321

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Feature interactions 328

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- Auxiliary product interactions 330

Feature packaging 331

Feature implementation 332

- Task summary list 332

Feature operation 337

Regional material statement

ISDN BRI trunking is not available in North America. Contact your system supplier or your Nortel Networks representative to verify support of this product in your area.

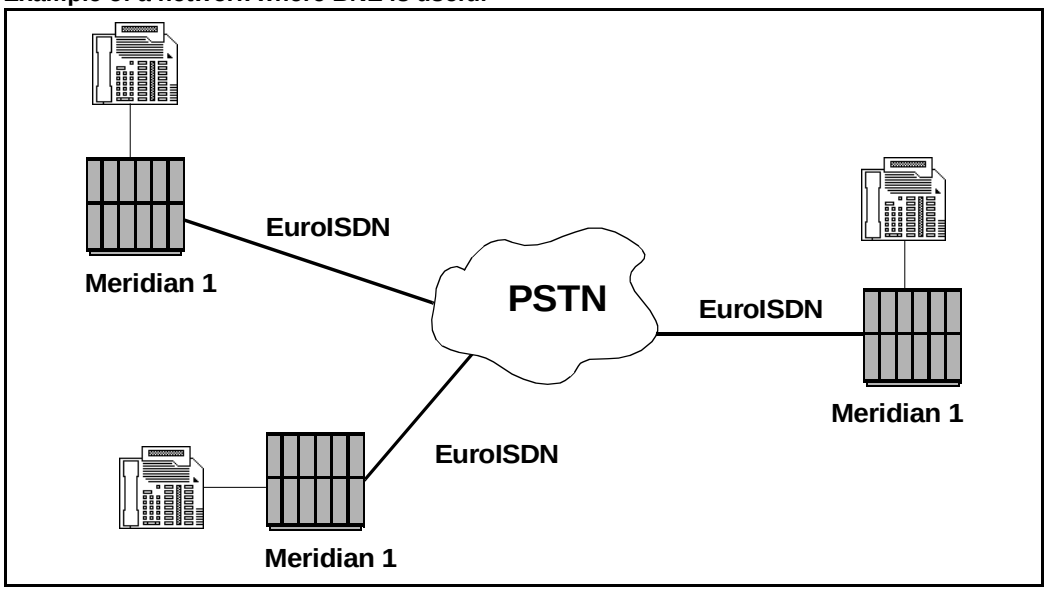
Feature description

Business Networking Express (BNE) is a term that refers to a group of EuroISDN network functionalities. The BNE capabilities provide Meridian 1 systems, connected on a EuroISDN public network, with the following functionalities:

- EuroISDN Call Completion
- EuroISDN Name and Private Number Display
- EuroISDN Call Diversion
- EuroISDN Explicit Call Transfer

BNE provides a Virtual Private Network (VPN) solution for Meridian 1 systems through the EuroISDN public network. BNE is appropriate for companies that require a network that operates like a private network, but has a lower initial cost. The Virtual Network Services (VNS) solution provides more features than BNE (VNS is a version of the ISL interface). However, VNS requires a leased line for the D-channel between the Meridian 1 systems.

Figure 11
Example of a network where BNE is useful



This chapter provides information about the EuroISDN Call Diversion aspect of the BNE package.

For information about the other BNE features, refer to the *Business Network Express/EuroISDN Name and Private Number Display* and *Business Network Express/EuroISDN Explicit Call Transfer* feature modules in this book.

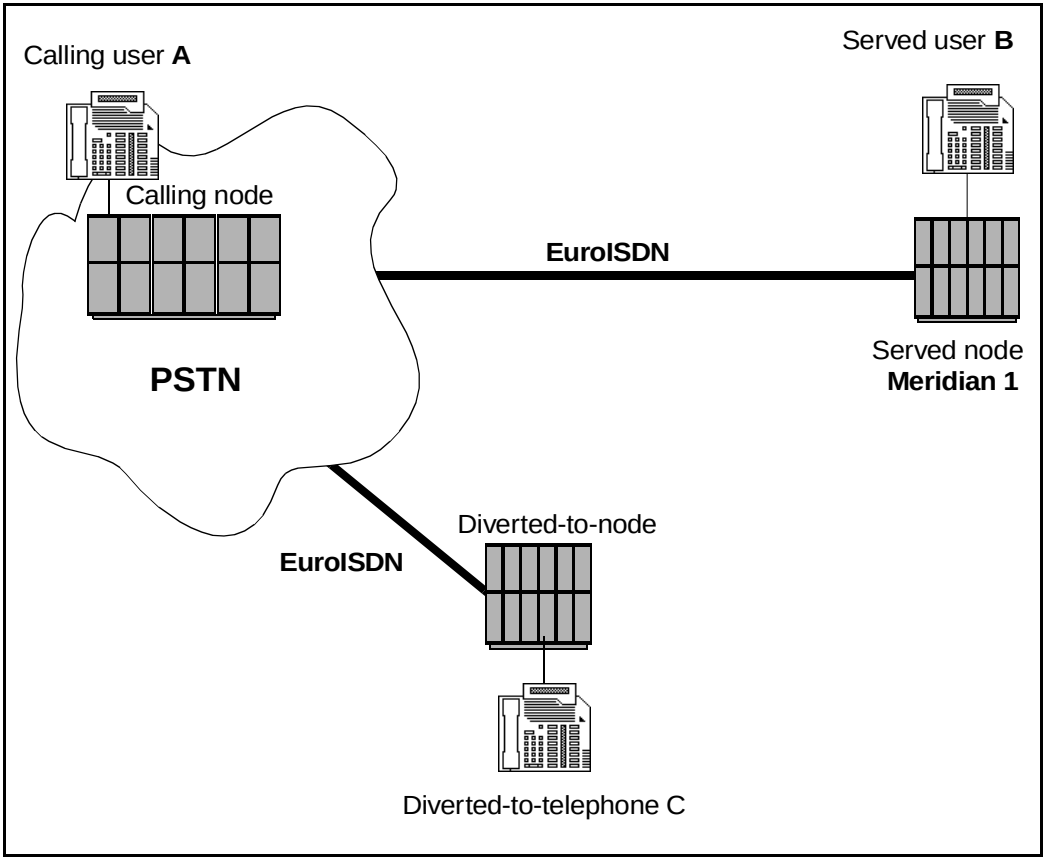
The Call Diversion supplementary services that are compliant with EuroISDN standard EN 300 207-1 include the following:

- Call Forwarding Unconditional (CFU) - known as Call Forward All Calls on the Meridian 1
- Call Forwarding Busy (CFB) - known as Hunting on the Meridian 1
- Call Forwarding No Reply (CFNR) - known as Call Forward No Answer on the Meridian 1

Refer to Table 34 on page 324 for a complete list of the equivalent features on the Meridian 1 supported by this feature.

This chapter uses the terms *served user* or *served telephone*. These terms refer to the telephone that is diverting calls to another telephone in the network. Figure 12 shows the component parts and terms used in the Call Diversion environment.

Figure 12
Call Diversion environment



Redirection services

The CFU service enables the network to redirect all calls, addressed to the ISDN number of a served telephone, to another telephone in the network. The CFU supplementary service does not affect the served user's ability to originate calls. The network forwards calls, independent of the status of the served telephone, when the CFU supplementary service is active.

The CFB service enables the network to redirect calls, addressed to the busy ISDN number of a served telephone, to another telephone in the network. The CFB service does not affect the served user's ability to originate calls.

When a call is not answered (for a defined period of time) at an ISDN number of a served telephone, the CFNR service enables the network to redirect calls to another telephone in the network. The CFNR supplementary service does not affect the served user's ability to originate calls.

Rerouting

The public EuroISDN network performs Call Rerouting. Rerouting is a network routing algorithm that performs call diversion by replacing the connection from user A's node (located in the public ISDN), to user B's node (located in a private ISDN), with another connection from user A's node to user C's node (located in the public ISDN). The new connection is established in the public ISDN by joining together the original connection from user A's node to the public ISDN gateway node and a second, new connection from the public ISDN gateway node to user C's node.

The Meridian 1 sends a Rerouting request to tell the network that it must reroute the call. This feature controls only the EuroISDN user side (the Meridian 1 side).

The following EuroISDN interfaces are supported:

- ETS 300 102 compliant
- EN 300 403 compliant

Class of Service

The Class of Service (CLS) of the served telephone affects the notification that the calling telephone and the final destination telephone receive. Tables 31 and 33 shows a summary of the relationships.

Table 31
Relationship between the served user's CLS and the calling user's notification

Served user's Class of Service	Calling user's notification
DN01	No notification
DN02	Notification without diverted-to-number
DN03	Notification with diverted-to-number (default)

The diverted-to-number displays on the calling user's telephone under the following conditions:

- if the information received indicates to allow presentation
- if the served user's CLS (received within the Diversion Notification Information from the served node) allows presentation.

Table 32 gives you examples of the display on the calling user's telephone under different conditions.

Table 32
Examples of calling user's display related to the served user's CLS (Part 1 of 2)

	Calling user's display	
Class of service of served telephone: "Calling user receives notification that call has been diverted"	**after receipt of served telephone's diversion notification information**	**after receipt of diverted-to-telephone's diversion notification information**

Table 32
Examples of calling user's display related to the served user's CLS (Part 2 of 2)

No		
	0164665000	0164665000
Yes without diverted-to-number		
	0164665000 F	0164665000 F
Yes with diverted-to-number		
	00164665000 F	0164666000 F

Table 33
Relationship between the served user's Class of Service and the notification on the final destination (diverted-to) telephone

Served user's Class of Service	Diverted-to-telephone receives
DNDN	Served telephone number not shown
DNDY	Served telephone number shown (default)

Diversion reason codes appear on the calling user's telephone and the diverted-to-telephone, if:

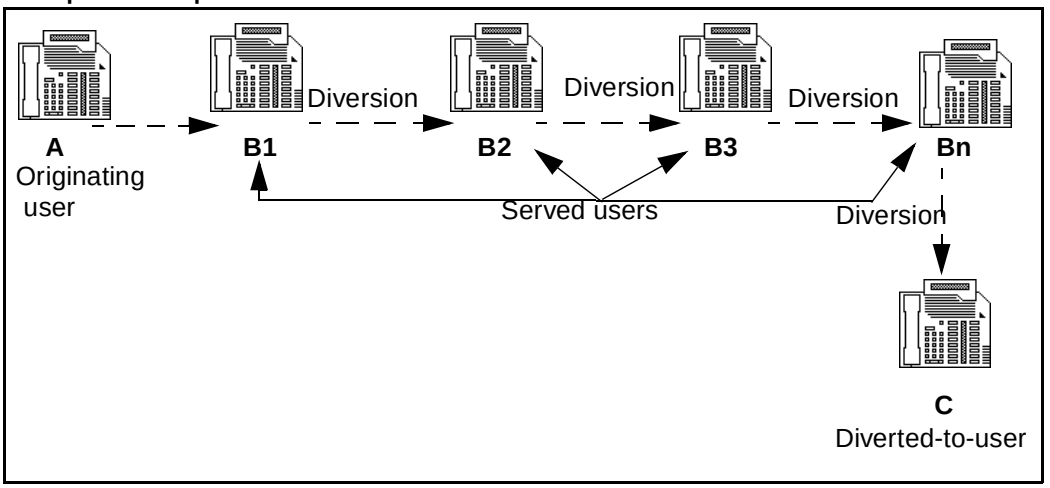
- they are programmed at their correct nodes in Overlay 95; and
- if the CLS of the served telephone allows it.

The redirection code displays when the telephone receives the Diversion Notification Information from the served node.

Multiple Diversions

For the purpose of discussion, assume that the following events occur: Originating user A calls B1. B1 has activated CFU, CFB or CFNR to B2. B2 has activated diversion to B3. B3 has activated diversion to the next telephone. Call diversion continues until telephone Bn activates diversion to telephone C. The user at telephone C answers.

Figure 13
Example of multiple diversions



Identification of the diverted-to-user to the calling user

Diversion Reason Notification rules:

The last diversion reason replaces the previous one.

Diverted-to-Number Notification rules:

When diversion first occurs, and for each diversion following, the Meridian 1 receives the following information from the served node (public ISDN):

- the CLS setting related to if “notify the calling user of diversion”
- the reason for redirection code
- the diverted-to-number

The Meridian 1 presents the diverted-to-number to the calling user if both the following conditions exist:

- any CLS information related to “notify the calling user of diversion” received contains the value “Yes with diverted-to number”
- any diverted-to-number information (the presentation indicator of the Redirecting Number IE) received allows the display of the diverted-to-number

The last diverted-to-number replaces the previous one.

Notification at the diverted-to-user

Diversion Reason Notification rules:

The rules are identical to that of a single diversion case.

Served Number Notification rules:

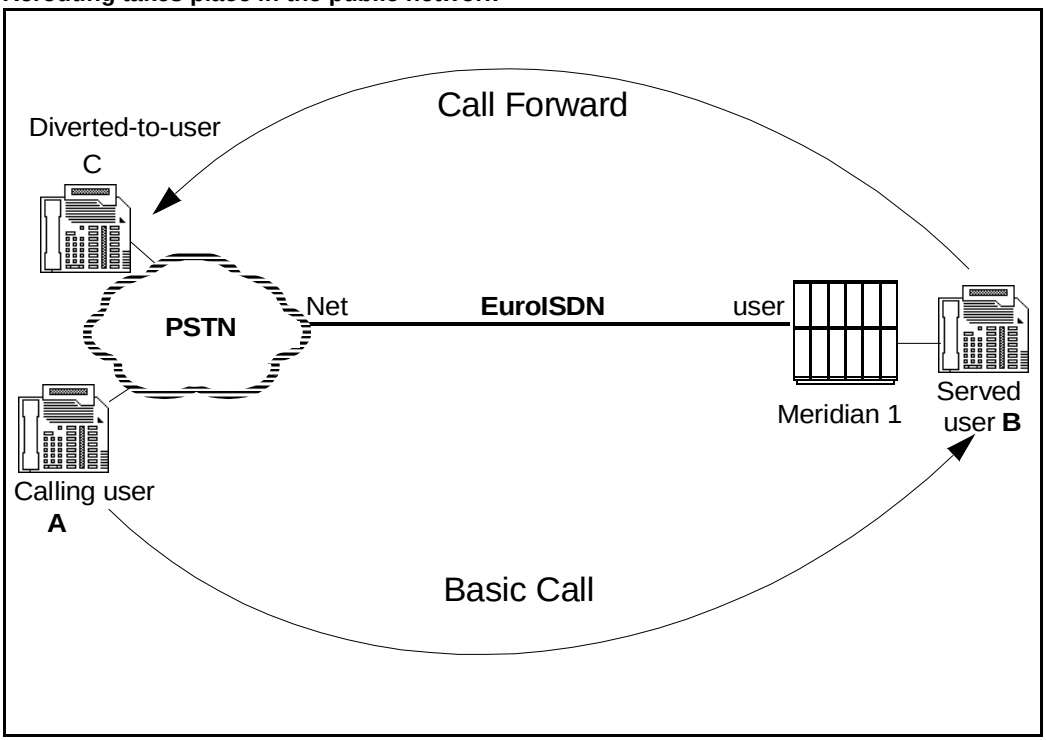
No served user number displays because of the digital telephone display limits.

Procedures for interworking with private ISDNs

A call from the public ISDN is diverted by rerouting

Figure 14 shows an example of interworking. In the figure, calling user A in the public network makes a call through a EuroISDN link to the served user B on a Meridian 1. The call is forwarded through a EuroISDN link to the diverted-to-user C in the public network.

Figure 14
Rerouting takes place in the public network



The Rerouting request sent by the Meridian 1 contains the following information:

- the rerouting reason. For multiple diversions within the same node, the rerouting reason is the reason for the last diversion.
- the diverted-to-address
- the number of diversions
- the embedded Bearer Capability IE, and if available, the Low Layer Compatibility IE or User-to-User IE information
- the served user, or the last served user number when there are multiple diversions. The Meridian 1 also sends presentation information. The presentation information can be one of the following values:

— "PresentationAllowedNumber" if the served user's CLS = DNDY

— "PresentationRestricted" if the served user's CLS = DNDN

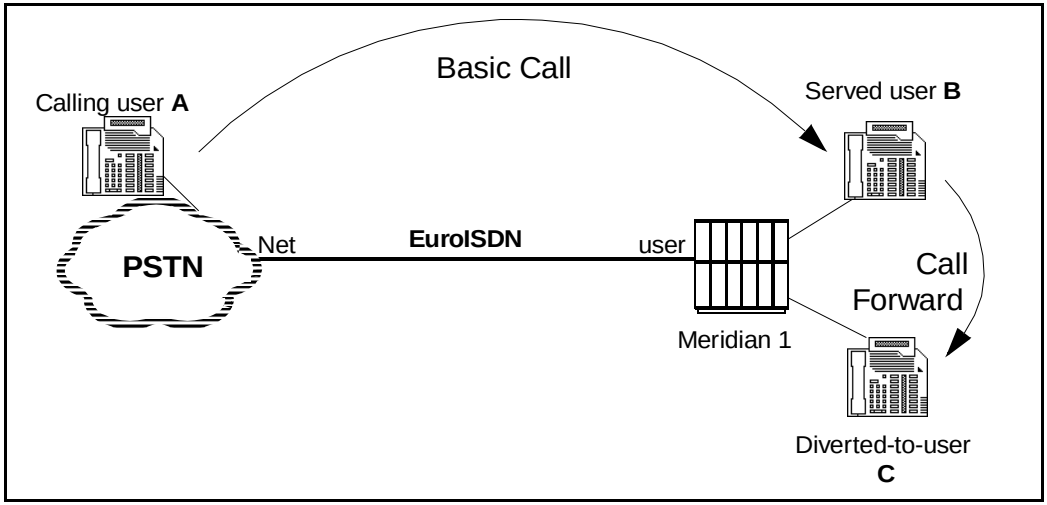
— "NumberNotAvailableDueToInterworking" - if the gateways perform this service

- the calling party subaddress, if available
- the calling user notification information, depending on the served user's CLS (see Table 31, "Relationship between the served user's CLS and the calling user's notification," on page 306).

A call from the public ISDN is diverted within the Meridian 1

Figure 15 shows an example of interworking. Calling user A, in the public network, calls through a EuroISDN link to the served user B on a Meridian 1. The call forwards to the diverted-to-user C on the same Meridian 1.

Figure 15
Call from the public ISDN is diverted within the Meridian 1



When the call is diverted to a telephone on the same Meridian 1, a FACILITY message, containing a DivertingLegInformation1, is sent by the Meridian 1 to the public ISDN. This DLI1 component contains the following information:

- the diversion reason

- the calling user notification information that depends on the served user's CLS (see Table 31, "Relationship between the served user's CLS and the calling user's notification," on page 306)
- the diverted-to user's number

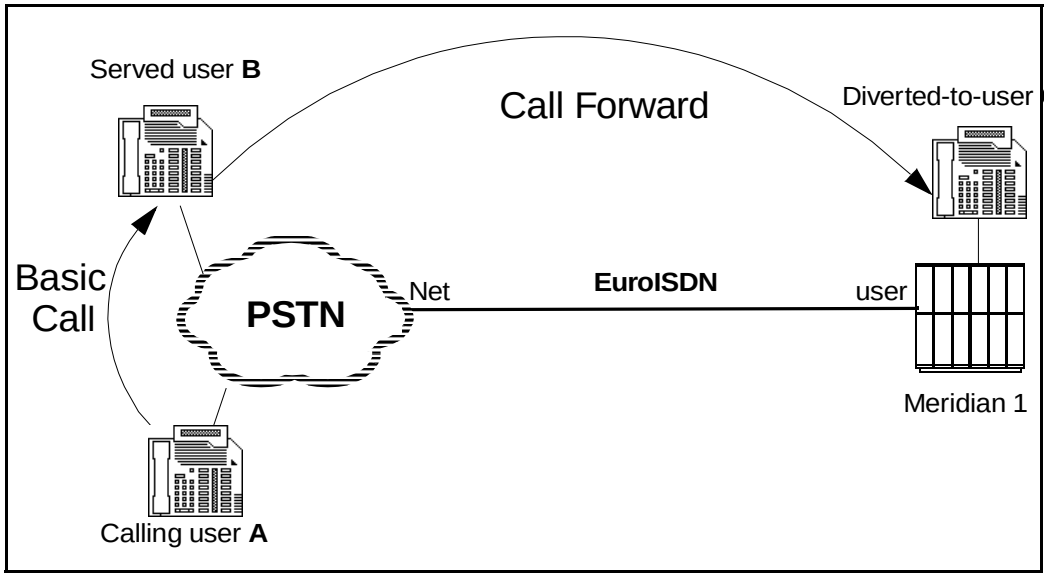
For CFU or CFB, when the diverted-to-telephone starts ringing, an ALERT message that includes Diversion Notification Information DLI3 (diverted-to-number-presentation-indicator) is sent back from the diverted-to-node to the public ISDN.

For CFNR, a second FACILITY message including Diversion Notification Information DLI3 (diverted-to number-presentation-indicator) is sent back from the diverted-to-node to the public ISDN.

Presentation of a call that is diverted within the public ISDN to the Meridian 1

Figure 16 shows an example of interworking. In this example, the calling user A in the public network makes a call to the served user B who is also in the public network. The call forwards to the diverted-to-user C on a Meridian 1 through the EuroISDN link.

Figure 16
The calling and served users are in the public network and the diverted-to-user is on the Meridian 1

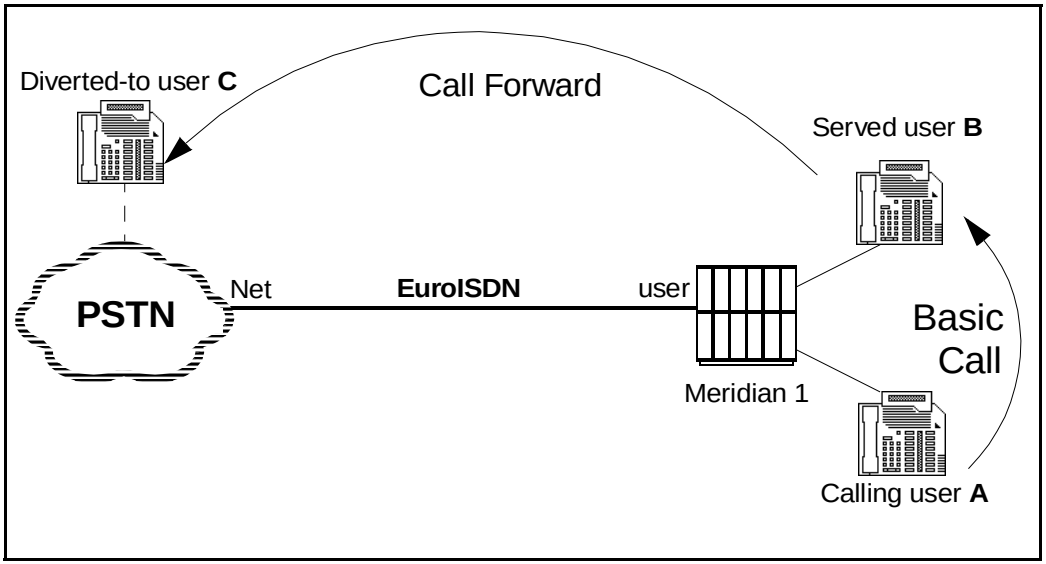


When the Meridian 1 receives a DivertingLegInformation 2 (DLI2) APDU, the diverted-to-user's display shows the diversion reason given in the DLI2 APDU and the calling user's number (even if the last served user's number is present in the DLI2 APDU), if presentation is allowed. No served user number displays due to the digital telephone display limitations. A DLI3, containing the Presentation Indictor of the diverted set, is also sent to the CO in an ALERT message for CFU/CFB or in a FACILITY message for CFNR.

Presentation of a diverted call from the Meridian 1 to the public ISDN

Figure 17 illustrates an example of interworking. In this illustration, the calling user A on a Meridian 1 makes a call to the served user B on the same Meridian 1. The call is then forwarded through a EuroISDN link to the diverted-to-user C in the public network.

Figure 17
The calling and served users are on the Meridian 1 and the diverted-to-user is in the public network



When a call is forwarded by a served user B to the diverted-to-user C in the public network, a SETUP message including a DivertingLegInformation 2 (DLI2) APDU is sent to the public network. This APDU contains the following information:

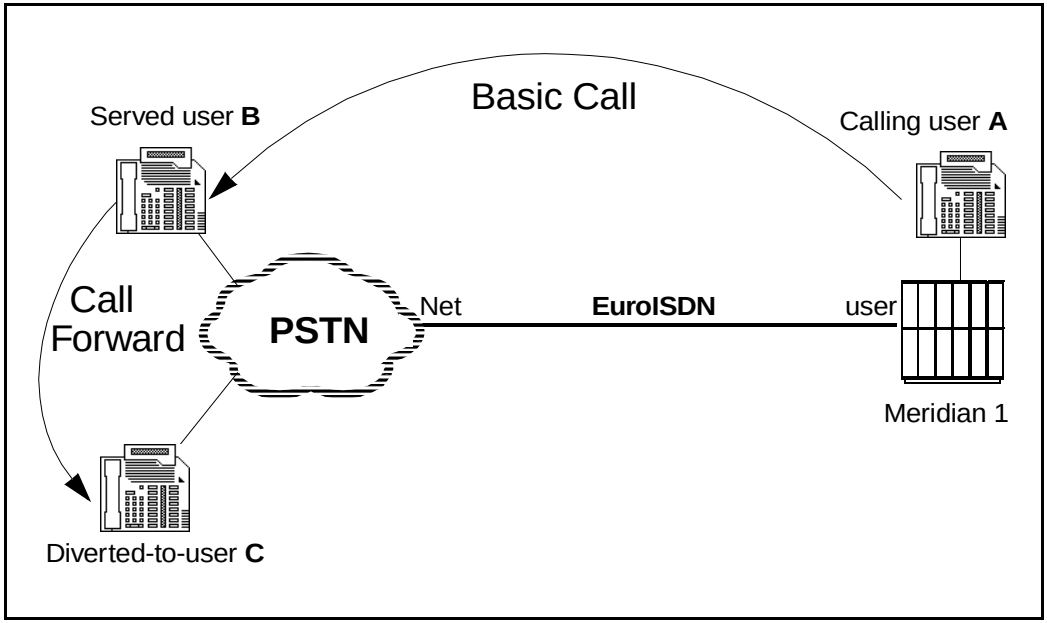
- diversionCounter - the number of times the call has been diverted
- diversionReason - the reason associated with the last diversion
- diversionNr - the ISDN number of the last served user (depending on the served user's Class of Service; see Table 33 on page 307)
- originalCalledNr - the ISDN number of the first served user (depending on the served user's Class of Service; see Table 33 on page 307)

A DLI3 message can be received from the public ISDN in a FACILITY or an ALERTING or a CONNECT message. The presentationAllowedIndicator affects whether the telephone displays the diverted-to-ISDN-user's number.

A call from the Meridian 1 is diverted within the public ISDN

Figure 18 illustrates an example of interworking. In this illustration, the calling user A, on a Meridian 1, makes a call through a EuroISDN link to the served user B in the public network. The call forwards to the diverted-to-user C who is also in the public network.

Figure 18
The calling user is on the Meridian 1 and the served user and the diverted-to-users are in the public network



The calling user displays the diversion reason and the diverted-to-number when both of the following events occur:

- after receiving a DLI1 message (in a FACILITY or a PROGESS or an ALERTING message)
- a DLI3 message (in a FACILITY or an ALERTING or a CONNECT message)

The calling user display depends on the received value of the CLS related to the “calling user is notified of diversion” and the presentationAllowedIndicator.

The PSTN can send a Notification Indicator IE and Redirection Number IE instead of DLI1 and DLI3. If this happens, the display on the originating telephone is updated when the system receives these IEs, the same way it does when it receives DLI1 and DLI3 messages.

QSIG, MCDN and DPNSS Gateways

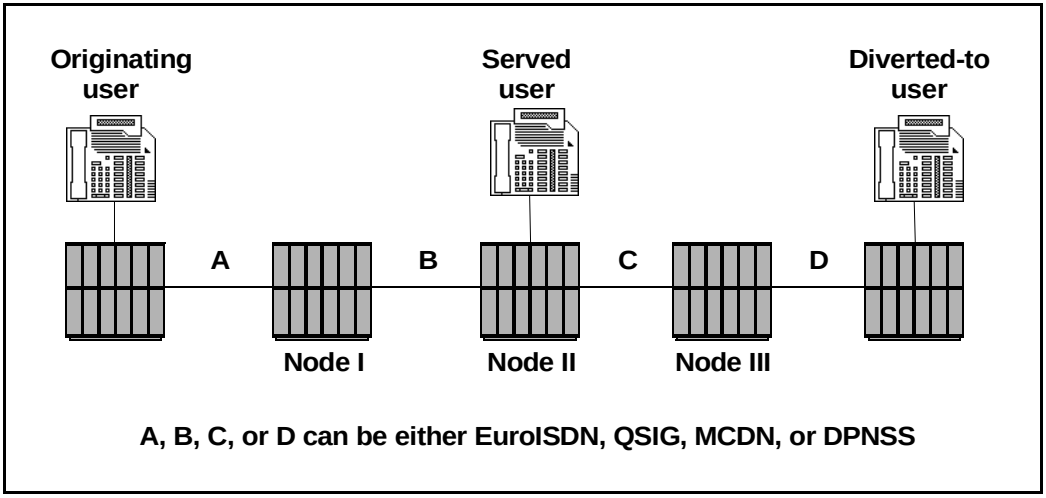
The BNE/EuroISDN Call Diversion feature allows notification to occur when the private network is a multi-node network using the following protocols (see figure 19):

- QSIG
- DPNSS
- MCDN

The notification of the originating, and diverted-to user, depends on the different protocols involved at various stages of the call establishment, and on the diversion specifications for the protocols.

For example, in case of a EuroISDN/DPNSS gateway, the presentation information is not mapped, since it is not supported by the DPNSS protocol.

Figure 19
Interworking with EuroISDN, QSIG, MCDN, or DPNSS.



Node I Gateways (A/B)

The following gateways can exist between the Originating user node and the Served user node (refer to Figure 19):

- **QSIG/EuroISDN and EuroISDN/QSIG**

  Because the messaging is the same for both protocols, the DLI1 and DLI3 APDUs are sent in the same message format as they were received in.

- **MCDN/EuroISDN**

  The Originating user is notified as soon as the Diversion information (DLI1 and DLI3) have been received at the gateway. DLI3 can be received either in an ALERTING, a FACILITY, or a CONNECT message. With the CONNECT message, the originating user is notified only at connection.

- **EuroISDN/MCDN**

  All diversion information is received at the gateway node in one message (NOTIFY) on the MCDN link. This information is mapped into the two Diversion information elements: DLI1 and DLI3, which are sent in two facility messages.

- **DPNSS/EuroISDN**

  The redirection information, DLI1 and DLI3, are both received on the EuroISDN link, but only DLI1 is mapped since Presentation Indication is not supported on DPNSS.

  In the case of Call Forward Unconditional or Call Forward Busy, the redirection information is mapped into a NAM message. Call forward No Reply is mapped into an EEM message.

  If the received DLI3 on EuroISDN indicates that presentation is restricted, an empty (without digit) DVD is sent on DPNSS.

- **EuroISDN/DPNSS**

  The diversion information (if available) received at the gateway on the DPNSS link is contained in the NAM message (for CFU and CFB) or the EEM message (for CFNR).

  Since DPNSS does not support Presentation Indication, all diversion information received on the DPNSS link is mapped into DLI1 information and sent on the EuroISDN link within a FACILITY message. For DLI3, the default value (Presentation allowed) is sent within either a FACILITY message (for CFNR) or ALERTING message (for CFU or CFB).

Node II Gateways (B/C)

The following gateways can exist at the Served user node (refer to Figure 19):

- **QSIG/EuroISDN and EuroISDN/QSIG**

  The call establishment message (SETUP) and the FACILITY message, with DLI1 APDU, are not impacted by this type of gateway and are sent with the diversion information.

  The sending of DLI3 APDU on the originating interface is done within the same message as it was received on the terminating interface (ALERTING, FACILITY, or CONNECT).

- **MCDN/EuroISDN**

  The call establishment message (SETUP) is not impacted by the gateway and is sent with the Diversion information.

  Once the gateway receives the DLI3 Diversion information, it propagates the redirection information by sending a NOTIFY message on the MCDN link. The information can be received in an ALERTING, FACILITY, or CONNECT message, depending on the network structure and on multiple redirection. Therefore, in a case where the DLI3 information is received in a CONNECT message, instead of an ALERTING message, the Originating user is notified at the connection.

- **EuroISDN/MCDN**

  The call establishment message (SETUP) is not impacted by the gateway and is sent with the Diversion information.

  DLI1 and DLI3 are both sent in a FACILITY message. The FACILITY message sending is triggered by the reception of the NOTIFY message on MCDN.

- **DPNSS/EuroISDN**

  The call establishment message (SETUP) is not impacted by the gateway and is sent with the Diversion information.

  In case of CFU and CFB, the DVD string is included into the NAM message. Otherwise, for CFNR, the DVD string is included into an EEM message.

  If the received DLI3 on EuroISDN indicates that presentation is restricted, an empty DVD is sent on DPNSS.

- **EuroISDN/DPNSS**

  The call establishment message (ISRM) is not impacted by the gateway and is sent with the Diversion information.

  The FACILITY message carrying the DLI1 information is sent as soon as the diversion occurs.

  The DLI3 information is sent in the ALERTING message for CFU and CFB, and in a FACILITY message for CFNR.

  Since Presentation Indication is not supported on DPNSS, default DLI3 information (presentation allowed) is sent on the EuroISDN link.

Node III Gateways (C/D)

The following gateways can exist between the Served user node and the Diverted-to user node (refer to Figure 19):

- **QSIG/EuroISDN and EuroISDN/QSIG**

  Because the messaging is the same for both protocols, the DLI2 and DLI3 APDUs are sent in the same message format as the one they were received in.

- **MCDN/EuroISDN**

  The call establishment message is mapped with the relevant information (DLI2 diversion information is included in the SETUP message on the EuroISDN link).

  Once the gateway receives the DLI3 diversion information, it propagates the redirection information by sending a NOTIFY message on the MCDN link. The information can be received in an ALERTING message (for CFU or CFB), in a Facility message (for CFNR), or in a CONNECT message (for CFU, CFB, or CFNR).

- **EuroISDN/MCDN**

  The call establishment message is mapped with the relevant information (diversion information is included in the SETUP message on the MCDN link).

  The redirection information is received on MCDN in a NOTIFY message which is sent:

  — after the ALERT message.

  — before the CONNECT message, if no ALERT message has been sent.

  This information is sent on EuroISDN in a FACILITY message with DLI3 APDU.

- **DPNSS/EuroISDN**

  The call establishment message is mapped with the relevant information (DLI2 Diversion information is included in the SETUP message on the EuroISDN link).

  The DLI3 information can be sent on the EuroISDN link in an ALERTING message, in a Facility message, or in a CONNECT message (depending on the reason of the redirection). However, since the DLI3 information (presentation indication) is not supported by DPNSS, then it is not necessary to wait for them at the gateway before sending the NAM message. So the NAM message is sent as soon as the ALERTING message is received.

- **EuroISDN/DPNSS**

  The call establishment message is mapped with the relevant information (Diversion information is included in the ISRM message on the DPNSS link).

  As soon as a NAM is received on the DPNSS link, it is mapped into an ALERTING message with DLI3 Diversion information (presentation always allowed).

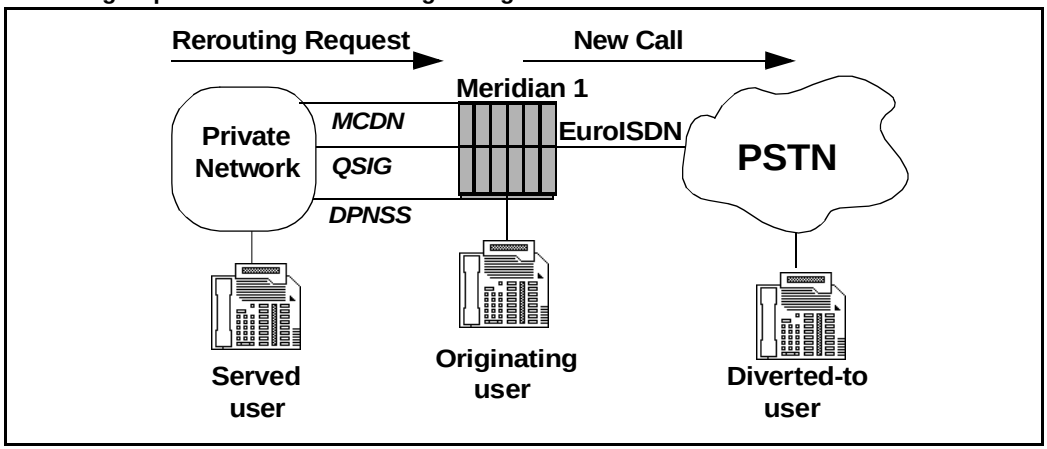
Message mapping for rerouting method

The rerouting method has different names, depending on which interface it applies. The diverting node can send a:

- Call Rerouting Request, on QSIG interfaces.
- TRO FACILITY message, on MCDN interfaces with TRO configured.
- Diverting-Immediate message, on DPNSS interfaces.

This can occur at the originating node or on a gateway node between the originating node and the served node (refer to Figures 20, 21, and 22).

Figure 20
Rerouting request received at the originating node.



Rerouting request received at the originating node

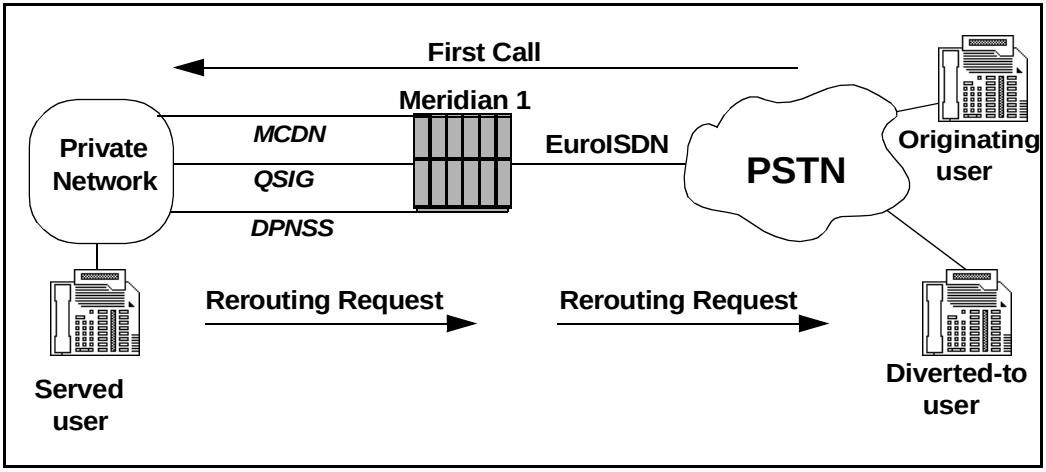
When a valid rerouting request is received on either a QSIG, MCDN or DPNSS interface, and the generation of a new call on the EuroISDN is necessary (due to the rerouting), a DLI2 APDU is included within the SETUP message sent on EuroISDN.

Rerouting request received at the gateway node

When receiving a rerouting request on a EuroISDN/QSIG, EuroISDN/MCDN or EuroISDN/DPNSS gateway node, the diverted-to number is analyzed to determine whether it is located within the private network, or in the public network.

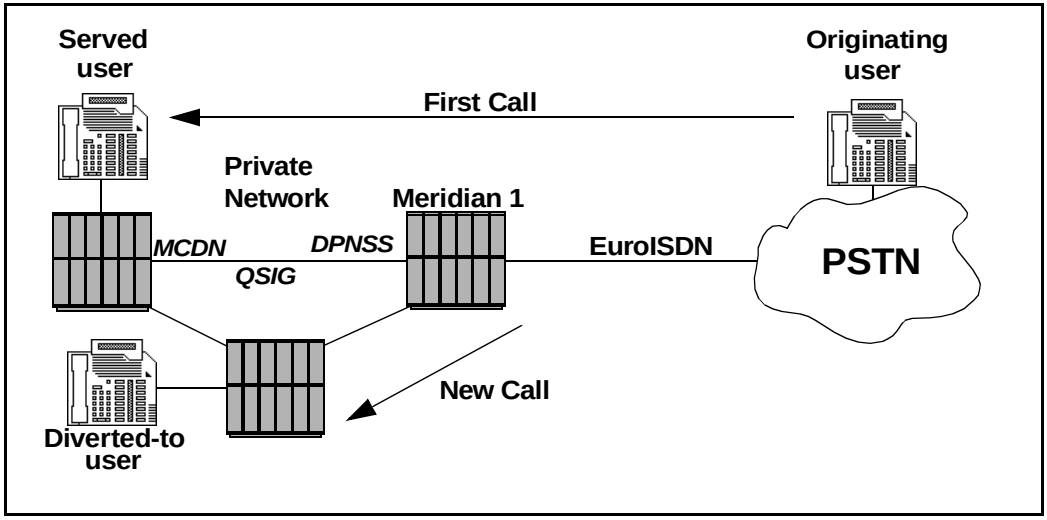
If the diverted-to user is located within the public network, a Call Rerouting Request is sent to the CO.

Figure 21
Call rerouting request sent to the CO.



If the diverted-to user is located within the private network, the request is processed by the gateway node.

Figure 22
Call rerouting request processed at the gateway node.



If the redirection reason is CFU or CFB, then a FACILITY message with DLI1 information is sent to the originating user as soon as the gateway node processes the rerouting request. If the redirection reason is CFNR, and an ALERT notification is received for the new call, then a FACILITY message with DLI1 information is sent to the originating user.

For the rest of the call establishment messaging, the rerouting node behaves as a gateway node II. It can be either QSIG, MCDN or DPNSS.

Operating parameters

Table 34 summarizes the correspondence between the ETSI reason for diversion supported by this feature, and the Meridian 1 equivalent features.

Table 34
Correspondence between the ETSI reason for diversion names and the Meridian 1 features

ETSI reason for diversion	Meridian 1 features
Call Forwarding Unconditional (CFU)	Call Forward All Calls
	Internal Call Forward
	BRI ETSI Call Forward Unconditional
	ICP Call Forward
Call Forwarding Busy (CFB)	Hunting
	Hunt by Call Type
	BRI Special Hunt
	Call Forward Busy
Call Forwarding No Reply	Call Forward No Answer
	Flexible Call Forward No Answer
	Second-Level Call Forward No Answer
	BRI Special Call Forward No Answer
	Call Forward No Answer by Call Type
	Attendant Forward No Answer
	Timed Reminder Recall (all types)
	Call Waiting Redirection

The following services included in EN 300 207-1 are not part of this feature:

- Call Deflection (CD)
- Selective Call Forwarding Busy (SCFB)
- Selective Call Forwarding No Reply (SCFNR)
- Selective Call Forwarding Unconditional (SCFU)

The BNE/EuroISDN Call Diversion feature has the following limitations:

- The served user does not receive an indication when a call is diverted.
- The calling user is notified each time a redirection occurs, if information is provided by the network. This means that:
  - — the last received notification replaces the previous diversion notification
  - — if a redirection occurs and no diversion information is provided by the network, the previous notification (if any) remains unchanged
- A user on the Meridian 1 cannot activate, deactivate, or interrogate EuroISDN Diversion on any switch remotely through the EuroISDN network. A user on another switch cannot activate, deactivate or interrogate EuroISDN Diversion on the Meridian 1 remotely through the EuroISDN network.
- Verification of the validity of the diverted-to-number is not supported.
- The EuroISDN Call Diversion supplementary service is not supported for BRI lines. This feature supports EuroISDN Call Diversion over PRI2 and BRI trunks. Any procedure that is specific to the BRI telephone is beyond the scope of this feature.
- The calling user can receive notification that a call has been diverted. There are three possible values:
  - — No

— Yes without diverted-to-number

— Yes with diverted-to-number (when available).

Due to the limitation of the number of digits that a digital telephone can display, only the diverted-to number displays, when available, on the calling telephone. The served user number does not display.

Table 35 summarizes the effect of these Class of Service settings on the calling user's display. These examples only show the information that is displayed on a telephone which is related to this feature. Each terminal has its own way of presenting the information and this feature does not change that.

For the purposes of this discussion, consider only the information type in the examples, not the information location.

For this example assume:

Served user's ISDN number: 0164665000

Diverted-to user's ISDN number: 0164666000

The reason for redirection code for Call Forward All Calls is "F.

Table 35
Relationship between the calling user's display and the served user's Class of Service

Served user's Class of Service related to the calling user's display	Calling user's display once diverted-to-telephone rings
No	0164665000
Yes without diverted-to number	0164665000 F
Yes with diverted-to number when available	0164666000 F

- The served user can release their number to the diverted-to-user. There are two possible values: No, Yes. Due to the limitation of the number of digits that a digital telephone can display, only the calling number displays on the diverted-to-telephone, independent of the served user's Class of Service.
- Table 36 summarizes the effect of these Class of Service settings on the display of the diverted-to-telephone. These examples only show the information that is displayed on a telephone which is related to this feature. Each terminal has its own way of presenting the information and this feature does not change that. For the purposes of this discussion, consider only the information type in the examples, not the information location.

  For this example assume:

  Calling user's ISDN number is: 0164664000

  The reason for redirection code for Call Forward All Calls is "F".

Table 36
Relationship between the display on the diverted-to-telephone and the served user's Class of Service.

Served user's Class of Service related to the diverted-to-telephone display	Display of the diverted-to-telephone
No	0164664000 F
Yes	0164664000 F

When both the calling and served telephones are on the same node, there is no change introduced with this feature. In particular, the served telephone's Class of Service has no impact on the notification to the calling user.

If the Central Office (CO) rejects the call rerouting request, the Meridian 1 does nothing. It remains in the same basic call state it was in before it sent the call rerouting request. The Meridian 1 waits for the CO to disconnect the call.

If a call from the public ISDN is diverted within the Meridian 1 and a reject component is received from the CO, the Meridian 1 accepts this information and continues to establish the call.

If a diverted call is presented from a public ISDN to the Meridian 1 and a reject component is received from the CO, the Meridian 1 accepts this information and continues to establish the call.

If a diverted call is presented from the Meridian 1 to the public ISDN and the Meridian 1 does not receive a DivertingLegInformation3 component after it receives a CONNECT message, it assumes that presentation of the diverted-to-number is not allowed and continues with the call establishment. If the Meridian 1 receives a reject component from the CO, it accepts this information and continues to establish the call.

If a call from the Meridian 1 is diverted within the public ISDN and the Meridian 1 does not receive a DivertingLegInformation3 component after it receives a CONNECT message, it assumes that presentation of the diverted-to-number is not allowed and continues with the call establishment. If the Meridian 1 receives a reject component from the CO, it accepts this information and continues to establish the call.

Feature interactions

Call Detail Recording (CDR)

When a call forwards by rerouting, no CDR ticket is generated because no established call takes place and the rerouting operation is done by the CO.

Call Forward by Call Type

This feature redirects internal and external calls differently with both the Call Forward No Answer and Hunting features. Different DNs are programmed for internal calls and external calls.

Call Forward by Call Type is supported by the EuroISDN Call Diversion service and the definition of an internal call is not modified by this feature. In particular, ISDN trunk calls using public numbering are considered external.

> ***Note:*** The system does not attempt to determine the real originating party with EuroISDN; it only looks at the type of numbering plan for the EuroISDN call.

Call Forward Option

The active Class of Service is always the served user's Class of Service. The EuroISDN Call Diversion feature is not affected by the OPT configuration (CFO/CFF) in the served user's Customer Data Block.

Call Waiting Redirection

The Call Waiting Redirection (CWTR) feature allows unanswered calls in the Call Waiting state to be redirected using Call Forward No Answer (CFNA). The waiting call redirects to the active telephone's CFNA DN, after the CFNA timer defined in the Customer Data Block expires. The CFNA DN (which can be a messaging service such as Meridian Mail, Voice Mail, and Message Center) handles this redirected call as an unanswered call.

The EuroISDN Call Diversion service handles this type of call as a usual Call Forward No Answer call.

Phantom TN

When a Phantom TN is Call Forwarded, the EuroISDN Call Diversion feature treats the Phantom TN as a normal TN.

Flexible Orbiting Prevention Timer

The Flexible Orbiting Prevention Timer feature prevents a call from being diverted off-node by the Call Forward feature at a station for a period of FOPT seconds after a call has already been forwarded off-node by a station. FOPT is defined on a customer group basis.

EuroISDN Call Diversion supports the Flexible Orbiting Prevention Timer feature. Consider using it as a workaround to help prevent Reciprocal Call Forward network-wide. However, while this feature allows you to avoid infinite looping, it also limits the number of diversions that can be performed by a telephone in a specified period of time. Therefore, if you expect frequent use of EuroISDN Call Diversion, consider using Total Redirection Count instead, which limits the number of diversions on a single call.

Call Forward/Hunt Override

The feature allows the use of the Flexible Feature Code for Call Forward/HUNT Override to override Call Forward All Calls, ICP-Call Forward, Call Forward No Answer, Hunting or Make Set Busy at the telephone level and by attendants, in both stand-alone and network (MCDN) applications.

This feature is not supported by EuroISDN Call Diversion. A Meridian 1 user can neither originate nor receive a call by using the FFC for CFHO through EuroISDN.

Access restrictions / trunk group access restrictions

EuroISDN Call Diversion is not performed if the served user is not able to access the route to the diverted-to-node.

Networking feature interactions

User to User (UUS1) services

The Meridian 1 does not support the diversion of UUS1 messages.

Network Automatic Call Distribution (NACD)

If a DID call terminates on an ACD DN, the DID call is linked to the ACD queue. NACD takes precedence over EuroISDN Call Diversion.

BNE Name and Private number display

After an incoming EuroISDN call with BNE Name information and a private CLID forwards through a EuroISDN network, the BNE information disappears from the display and is replaced by the notification numbers provided by the Call Diversion feature.

Auxiliary product interactions

Symposium Call Center Server

The call type is updated in the SCC message if the EuroISDN call is diverted to a CDN.

Meridian Link

Present Call Indication (PCI)

This message contains an IE called “Call Type” which contains diversion information about the incoming call. This field is updated for an incoming diverted EuroISDN call.

Unsolicited Status Message (USM)

When a telephone stops ringing because the Call Forward No Answer feature has sent the call to the EuroISDN network, a USM message is sent to Meridian Link.

Meridian Mail

A call diverted to Meridian Mail through EuroISDN can access Meridian Mail functionalities (such as message reception and mailbox interrogation) in the same way as a simple call to the mailbox.

Feature packaging

The following software packages are required for this feature to operate on EuroISDN BRI Trunks:

- Call Party Name Display (CPND) package 95
- ISDN Supplementary Features (ISDN INTL SUP) package 161
- Basic Rate Interface (BRI) 216
- Multipurpose Serial Data Link (MSDL) package 222
- ISDN BRI Trunk Access (BRIT) 233
- EuroISDN (EURO) package 261
- Business Networking Express (BNE) package 367

The following software packages are required for this feature to operate on a EuroISDN PRI2 network:

- Call Party Name Display (CPND) package 95
- Primary Rate Access (PRA) package 146
- 2.0 Mb Primary Rate Interface (PRI2) package 154
- ISDN Supplementary Features (ISDN INTL SUP) package 161
- International Primary Rate Access (IPRA) package 202
- Multipurpose Serial Data Link (MSDL) package 222
- EuroISDN (EURO) package 261
- Business Networking Express (BNE) package 367

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 10 – Configure Analog (500/2500 type) set for EuroISDN Call Diversion notification.

2 LD 11 – Configure digital telephone for EuroISDN Call Diversion notification.

3 LD 27 – Configure the BRI Digital Subscriber Loop for EuroISDN Call Diversion notification.

4 LD 27 – Configure BRI telephone for EuroISDN Call Diversion notification.

5 LD 95 – Configure the redirection reason codes.

6 LD 16 – Configure EuroISDN Call Diversion on BRI Trunks.

7 LD 17 – EuroISDN Call Diversion configuration on PRI2 trunks.

LD 10 – Configure Analog (500/2500 type) set for EuroISDN Call Diversion notification.

Prompt	Response	Description
REQ:	CHG	Change.
TYPE:	500	Analog (500/2500 type) set.
TN	l s c u c u	Terminal Number. For Option 11C.
DN	x..x	Directory Number.
...	...	
HUNT	x..x	Hunt DN.

CLS		Class of Service.
	DN01	Call Diversion: No notification to the calling user.
	DN02	Call Diversion: Notification without diverted-to-number to the originating user.
	(DN03)	Call Diversion: Notification with diverted-to-number to the originating user.
	DNDN	Call Diversion: no served user's number notification to the diverted-to-user.
	(DNDY)	Call Diversion: served user's number notification (when available) to the diverted-to-user.
	CFXA	Call Forward to external DN allowed.
	HTA	Hunting allowed.
	FNA	Call Forward No Answer allowed.
	CFTA	Call Forward by Call Type allowed.
	DDGA (DDGD)	DN Display on the other set allowed (denied).
...	...	
FTR		Features.
	CFW nn x..x	Call Forward All Calls, maximum number of digits, destination number.
	EFD x..x	External Flexible Call Forward No Answer DN.
	EHT x..x	External Hunt DN.
	FDN x..x	Flexible Call Forward No Answer DN.
...	...	

LD 11 – Configure digital telephone for EuroISDN Call Diversion notification.

Prompt	Response	Description
REQ:	CHG	Change.
TYPE:	aaaa	Telephone type.
TN	l s c u c u	Terminal Number. For Option 11C.

FDN	x..x	Call Forward No Answer DN (for internal calls if Call Forward by Call Type is active).
CLS	DN01	Call Diversion: No notification to the calling user.
	DN02	Call Diversion: Notification without diverted-to-number to the originating user.
	(DN03)	Call Diversion: Notification with diverted-to-number to the originating user.
	DNDN	Call Diversion: no served user's number notification to the diverted-to-user.
	(DNDY)	Call Diversion: served user's number notification (when available) to the diverted-to-user.
	CFXA	Call Forward to external DN allowed.
	HTA	Hunting allowed.
	FNA	Call Forward No Answer allowed.
	CFTA	Call Forward by Call Type allowed.
	DDGA (DDGD)	DN Display on the other set allowed (denied).
...	...	
EFD	x..x	External Flexible Call Forward No Answer DN.
HUNT	x..x	Hunt DN.
EHT	x..x	External Hunt DN.
...	...	

LD 27 – Configure the BRI Digital Subscriber Loop for EuroISDN Call Diversion notification.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	DSL	Digital Subscriber Loop.
DSL	l s c dsl c dsl	Digital Subscriber Loop address. For Option 11C.
...	...	
FDN	x..x	Flexible Call Forward No Answer DN.

EFD	x..x	External Flexible Call Forward No Answer DN.
HUNT	x..x	Hunt DN.
EHT	x..x	External Hunt DN.
...	...	

LD 27 – Configure BRI telephone for EuroISDN Call Diversion notification.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	TSP	Terminal Service Profile.
DSL	l s c dsl c dsl	Digital Subscriber Loop address. For Option 11C.
...	...	
DN	x..x y..y	Directory Number and CLID entry.
- CT	aaa	Call Types for the DN (aaa = VCE or DTA). VCE = circuit switched voice, DTA = circuit switched data.
FEAT		Features.
	CFTA	Call Forward by Call Type allowed.
	CFXA	Call Forward to external DN allowed.
	DN01	Call Diversion: No notification to the calling user.
	DN02	Call Diversion: Notification without diverted-to-number to the originating user.
	(DN03)	Call Diversion: Notification with diverted-to-number to the originating user.
	DNDN	Call Diversion: no served user's number notification to the diverted-to-user.
	(DNDY)	Call Diversion: served user's number notification (when available) to the diverted-to-user.
	FNA	Call Forward No Answer allowed.
	HTA	Hunting allowed.

SSRV_ ETSI		ETSI Supplementary Service. Prompted if PRID = 2 (ETSI) in the DSL.
	VCFW	Voice Call Forward. VCFW is valid if CT = VCE or if CT = VCE and DTA.
	DCFW	Data Call Forward. DCFW is valid if CT = DTA or if CT = VCE and DTA.
...	..	

LD 95 – Configure the redirection reason codes.

Prompt	Response	Description
REQ	NEW CHG	New. Change.
TYPE	CPND	Call Party Name Display.
...	...	
RESN	YES	Allow display of reason for redirection codes.
CFWD	aaaa (F)	Mnemonic for Call Forward All Calls display.
CFNA	aaaa (N)	Mnemonic for Call Forward No Answer display.
HUNT	aaaa (B)	Mnemonic for Hunting/Call Forward Busy display.
...	...	

LD 16 – Configure EuroISDN Call Diversion on BRI Trunks.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	RDB	Route Data Block.
...	...	
IFC	E403	ETS 300 403 compliant EuroISDN.
	EURO	ETS 300 102 compliant EuroISDN. ***Note:*** this feature is supported by either interface type.

CNTY	aaaa	All countries that are supported by the E403 interface: ETSI, AUS, DEN, FIN, GER, ITA, NOR, POR, SWE, DUT, EIR, SWI, ESP, UK, BEL, FRA, CIS.
...	...	
RCAP	DV3I	EuroISDN Call Diversion.
...	...	

LD 17 – EuroISDN Call Diversion configuration on PRI2 trunks.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	CFN	Configuration Record.
...	...	
IFC	E403	ETS 300 403 compliant EuroISDN.
	EURO	ETS 300 102 compliant EuroISDN. ***Note:*** this feature is supported by either interface type.
CNTY	aaaa	Countries that are supported by the E403 interface: ETSI, AUS, DEN, FIN, GER, ITA, NOR, POR, SWE, DUT, EIR, SWI, ESP, UK, BEL, FRA, CIS.
...	...	
RCAP	DV3I	EuroISDN Call Diversion.
...	...	

Feature operation

No specific operating procedures are required to use this feature.

Business Networking Express/EuroISDN Explicit Call Transfer

Contents

The following are the topics in this section:

Regional material statement 339
Feature description 340
Business Networking Express 340
BNE/EuroISDN Explicit Call Transfer 341
Call Transfer through the PSTN 345
Call Transfer Notification Display 347
Operating parameters 352
Feature interactions 353
Networking feature interactions 354
Auxiliary product interactions 354
Feature packaging 354
Feature implementation 355
Task summary list 355
Feature operation 358

Regional material statement

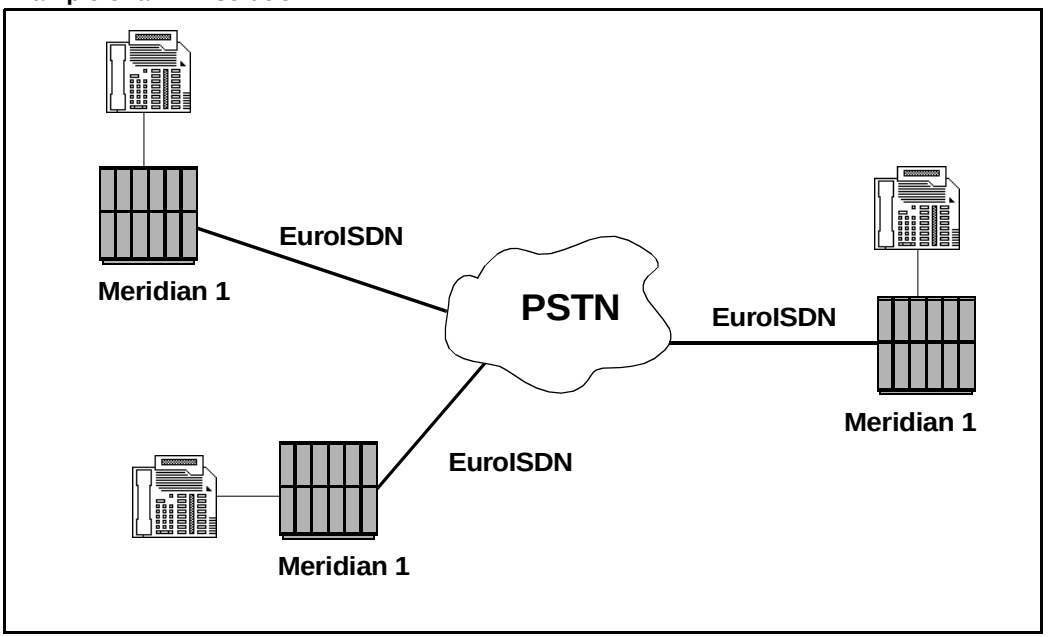
ISDN BRI trunking is not available in North America. Contact your system supplier or your Nortel Networks representative to verify support of this product in your area.

Feature description

Business Networking Express

Business Networking Express (BNE) is a Virtual Private Network (VPN) solution for connecting several Meridian 1 systems through a EuroISDN interface. The BNE solution is a mix of EuroISDN public services and select Meridian 1 proprietary features. Refer to Figure 23 for an example.

Figure 23
Example of a BNE solution



The BNE solution provides the following functionality between Meridian 1 sites:

- EuroISDN Call Completion
- EuroISDN Name and Private Number Display
- EuroISDN Call Diversion
- EuroISDN Explicit Call Transfer

BNE/EuroISDN Explicit Call Transfer

While Call Transfer functionality exists on EuroISDN with the X11 software feature “Call Transfer”, this feature extends the functionality of the private network:

- to notify the public network that a transfer has occurred within the private network

and

- to optimize the call, by requesting the public network to perform the transfer

This service is supported by either EURO (compliant with ETS 300-102) or E403 (compliant with ETS 300-403) interfaces.

BNE/EuroISDN Explicit Call Transfer example

Telephone A connects to telephone B. Telephone A transfers telephone B to telephone C. Telephone A is on the served node, telephones B and C are on the remote nodes.

At least one call, telephone A to B, or telephone A to C, is over a EuroISDN link. The Meridian 1 supports the functionality Explicit Call Transfer at the served node (the node receiving the original call) and at the remote nodes.

With this feature, the Meridian 1 can, depending on network configuration:

- send transfer notifications on a EuroISDN link
- receive transfer notifications on a EuroISDN link
- activate Call Transfer within the public network on a EuroISDN link

There are three types of network configuration:

- Only the Served User (A) is in the Meridian 1 private network (or stand alone Meridian 1). The Meridian 1 sends transfer notifications to, or activates Call Transfer within PSTN. Refer to Figure 24 and Figure 25.

Figure 24
Served User A is the only one in the Meridian 1 private network (or stand alone Meridian 1

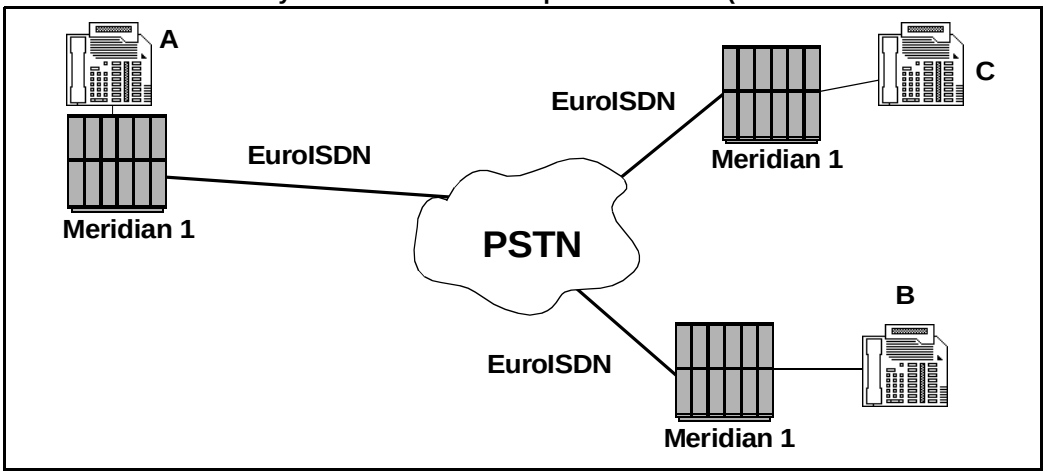
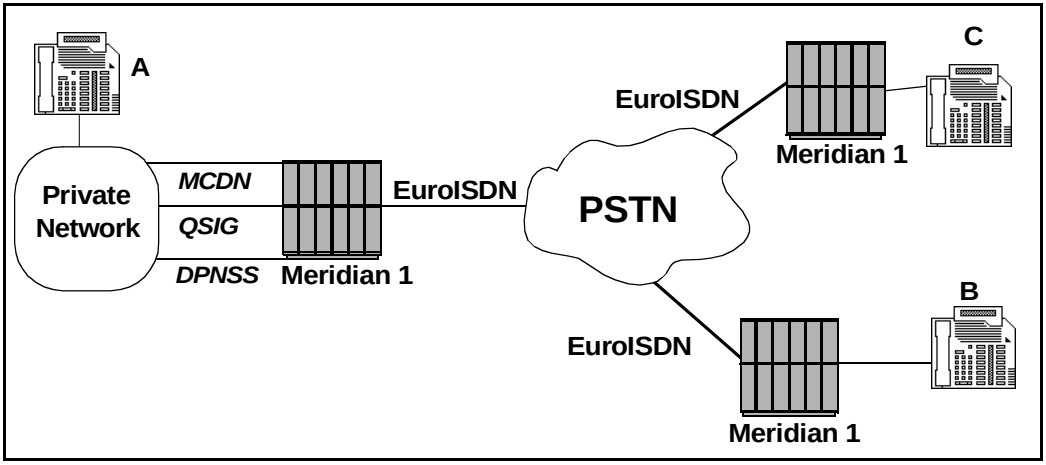


Figure 25
Served user A is the only one in the Meridian 1 private network. The Meridian 1 acts as a gateway.



- The served user (A) and one of the remote users (B or C) are in the Meridian 1 private network. The Meridian 1 sends transfer notifications. Refer to Figures 26 to 28. In a gateway connection, the Meridian 1 can be the gateway node (Figure 27), or the gateway node and the served node together (Figure 28).

Figure 26
User A and user B or C are in the Meridian 1 private network

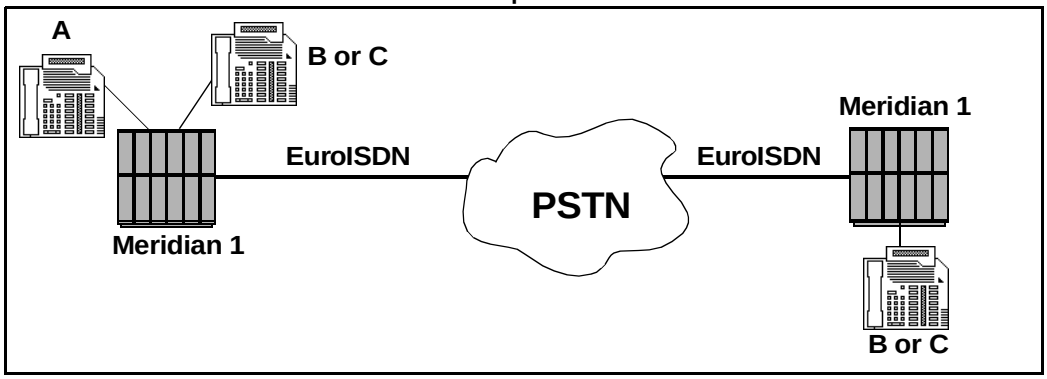


Figure 27
User A and user B or C are in the Meridian 1 private network.
The Meridian 1 acts as a gateway.

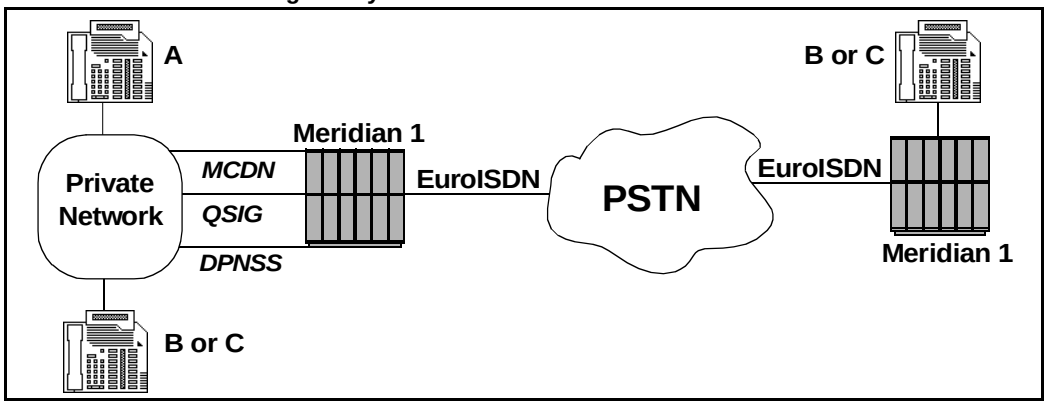
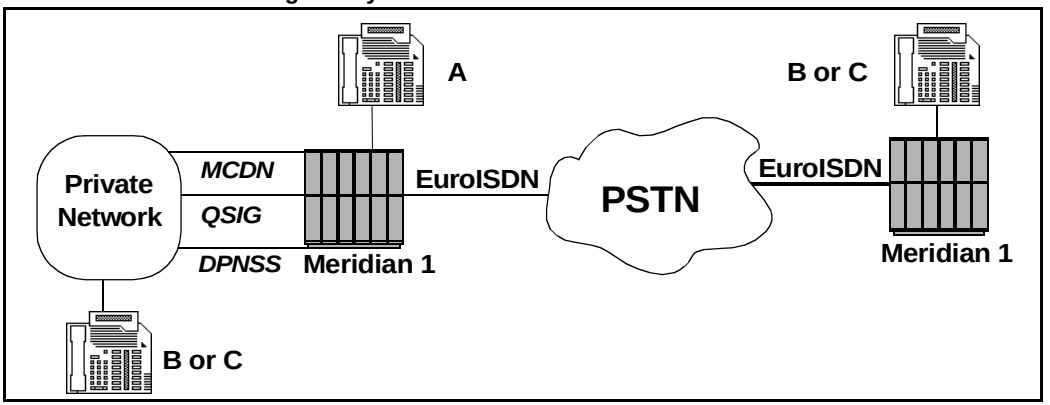


Figure 28
User A and user B or C are in the Meridian 1 private network. The Meridian 1 acts as a gateway node and a served node.



- Only remote user(s) B or C, or B and C, are in the Meridian 1 private network. The Meridian 1 receives transfer notifications. Refer to Figures 29 and 30.

Figure 29
Remote user B or C is in a Meridian 1 private network

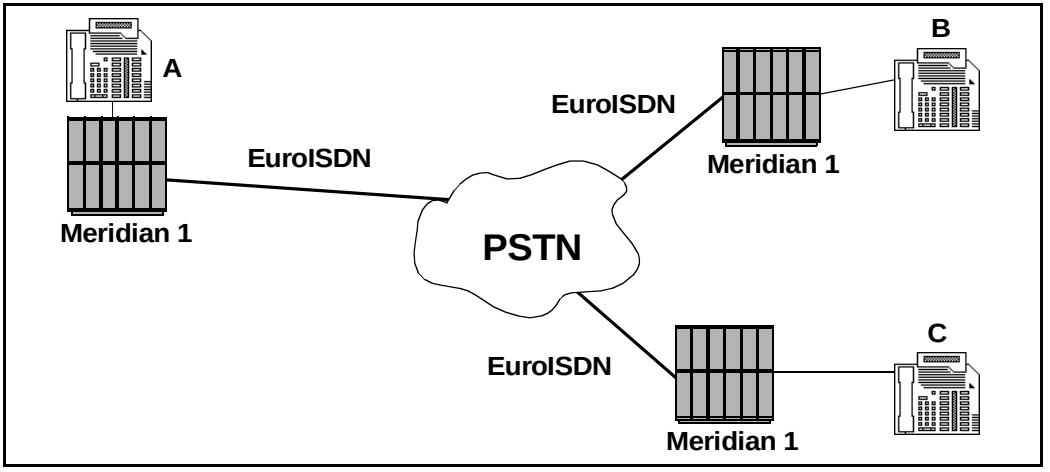
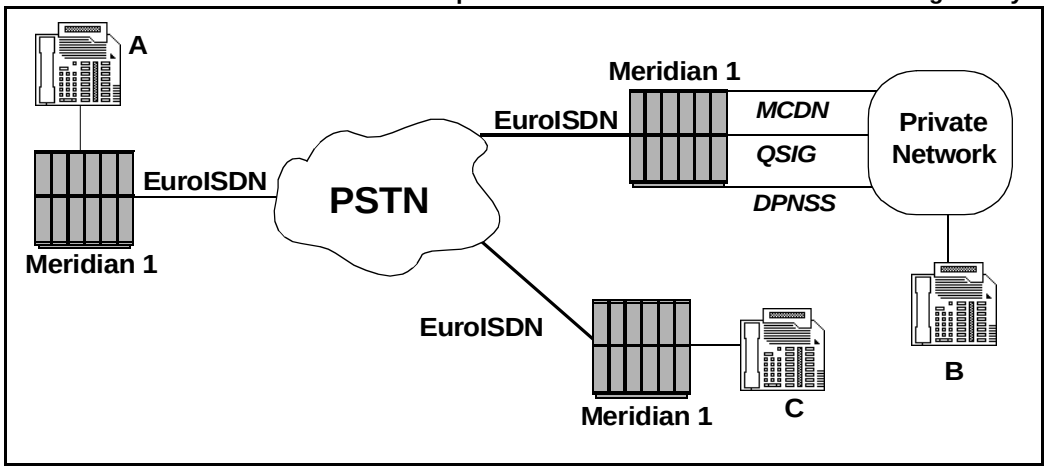


Figure 30
Remote user B or C is in the Meridian 1 private network. The Meridian 1 acts as a gateway.



Call Transfer through the PSTN

When all of the following conditions are met, Call Transfer through the PSTN is possible:

- Only the served user, A, is in the Meridian 1 private network (refer to Figure 24).
- Both D-channels required in the transfer have the Remote Capability for Call Transfer notification and invocation (ECTO) configured.

  Note: In most situations, D-channels 1 and 2 are the same.

- Both calls are in the established call state.

The Meridian 1, working as the served node, invokes the Call Transfer in the public network. This can optimize trunk usage by suppressing tromboning between the Meridian 1 and the PSTN. Trunk optimization occurs only when both calls involved in the transfer are in the established call state.

With a supervised transfer, the transfer (by join) is first completed on the Meridian 1, and notifications are sent to the PSTN. If the conditions are met, the Meridian 1 invokes Explicit Call Transfer to the PSTN.

With an Unsupervised transfer, the transfer (by join) is first completed on the Meridian 1, and notifications are sent to the PSTN. The Meridian 1 waits until both calls are in an established call state. When both calls are established, and all the conditions are met, the Meridian 1 invokes Explicit Call Transfer in the PSTN.

The Explicit Call Transfer invocation takes place in three steps:

- Request of LinkId to the Public Network
- Request of Call Transfer, using the received LinkID
- Reception of Call Transfer Confirmation

The served node (Meridian 1) requests a LinkId for Call Transfer to the Public Network, for the call between user A and user B. The served node stores the LinkId received. This LinkId is used by the PSTN to link the two calls involved in the transfer.

Then the served node requests an Explicit Call Transfer for the call between user A and user C, sending the Linkid previously received.

Upon receipt of the Call Transfer request, the public network releases the LinkId value, by:

- connecting user B to user C in the public network.
- disconnecting the call between user A and user C.
- sending the result of the Call Transfer request.
- disconnecting the call between user A and user B.

If the public network does not reply to the LinkId or Call Transfer requests, or reply with an error or rejection component, no action is taken by the Meridian 1. If this occurs, transferred and transferred-to nodes are not informed of the transfer. It will not have any impact on the served and remote users, because the call was already transferred by the Meridian 1.

Call Transfer Notification Display

If the network provides the information, the originating caller is notified, on the display of the telephone, when a transfer occurs. This means that:

- if a previous Call Transfer notification was provided, it is replaced by the last received notification.
- if a transfer occurs, with no Call Transfer information provided by the network, and a previous notification was provided, the notification remains unchanged.

The following scenario is considered to be a standard Call Transfer situation (refer to Figures 31, 32, 33, and 34):

1 User B calls user A

2 User A answers the call

3 User A presses the transfer key, and calls user C.

4 User A presses the Call Transfer key again to complete the transfer (the transfer can be completed when the secondary call is alerting or established).

Figure 31
User B calls user A. User A transfers call to user C.

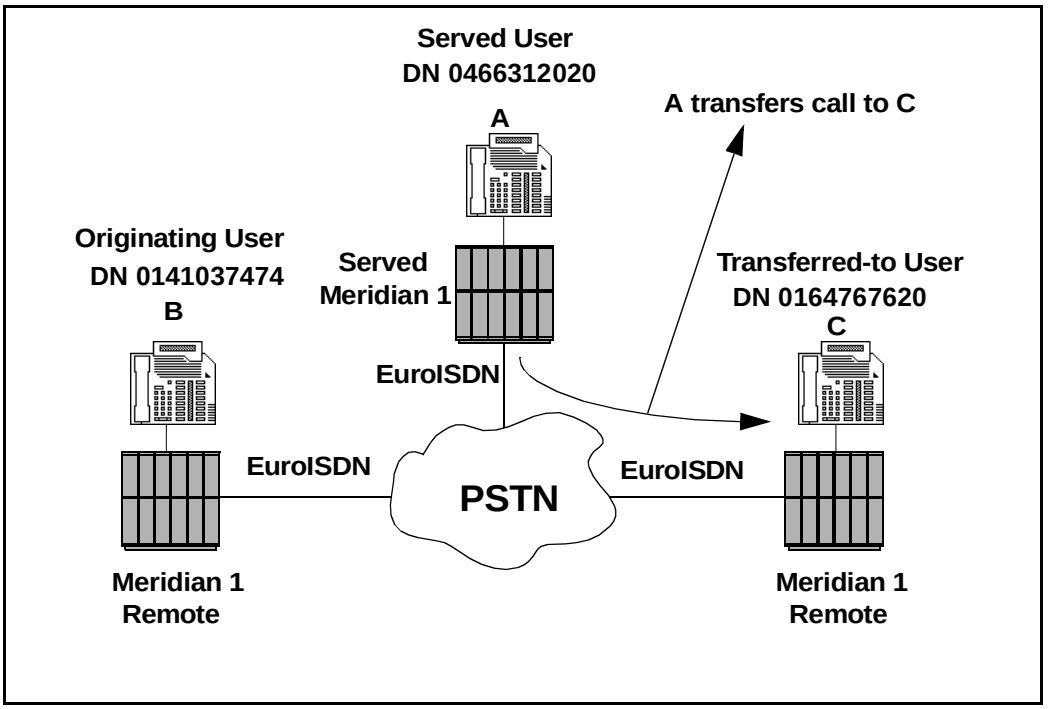


Figure 32
Display of established call between user A and user B

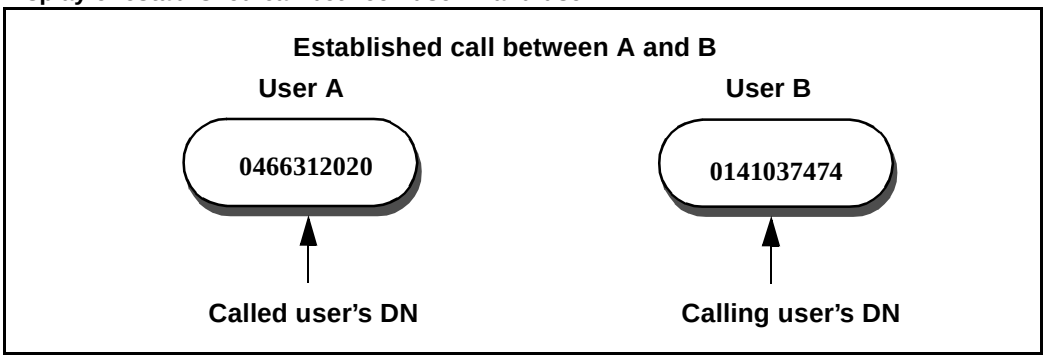


Figure 33
User A presses Call Transfer key and calls user C

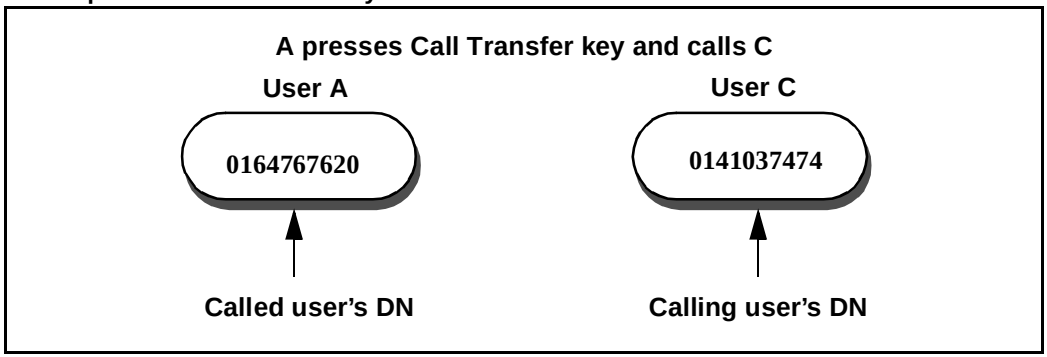
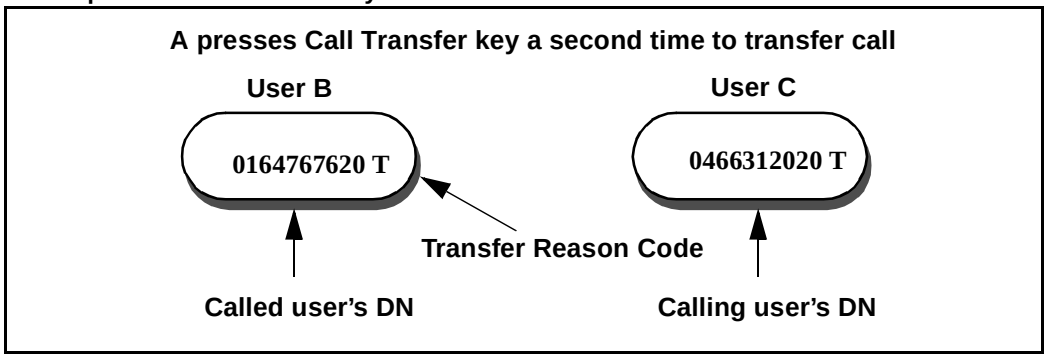


Figure 34
User A presses Call Transfer key a second time to transfer the call to user C



Call Transfer Notifications Display Rules

The Call Transfer Notifications Display Rules are similar to Transfer Notifications rules on a Meridian 1 private link, and depend on the:

- Class of Service configured on the telephones
- Presentation Indicator of the Redirection Number received

Class of service definitions:

- DDGA – DN Display on other telephone Allowed
- DDGD – DN Display on other telephone Denied

- CNDA – Calling Name Display Allowed
- CNDD – Calling Name Display Denied.

Note: The reason is displayed on a telephone only when the CNDA Class of Service is configured.

Transferred and Transferred-to users' notification rules

Transfer Reason Notification rules:

The reason displayed on the Transferred or Transferred-to user's telephone (when the transfer notification information is received from the served node) is configured in Overlay 95. No redirection reason is displayed on a telephone if the CNDD Class of Service is configured

Redirection Number Notification rules:

The redirection number displays on the user's telephone if the received presentation information indicates that presentation is allowed. Otherwise, the telephone displays the trunk route access code and trunk route member number (instead of the redirection number).

If a remote user has the DDGD Class of Service defined, the telephone sends its number in a redirection number with the Presentation Indicator set to Presentation Restricted.

If a remote user has the DDGA Class of Service defined, the telephone sends its number in a redirection number with Presentation Indicator set to Presentation Allowed.

Table 37 on page 351 identifies the originating user's notification according to the originating and transferred-to users' configuration options.

Table 37
Originating and Transferred-to users' notification in a Meridian 1 environment (Part 1 of 2)

CLS *Originating user* telephone B DN 0141037474	**CLS** *Transferred-to user* telephone C DN 0164767620	Originating user's display after receipt of Transferred-to user's transfer notification information	Transferred-to user's display after receipt of originating user's transfer notification information
CNDA DDGA	CNDA DDGA	0164767620 T	0141037474 T
CNDD DDGA	CNDD DDGA	0164767620	0141037474
CNDA DDGD	CNDA DDGA	0164767620 T	211-4 T
CNDD DDGD	CNDD DDGA	0164767620	211-4

Table 37
Originating and Transferred-to users' notification in a Meridian 1 environment (Part 2 of 2)

CLS *Originating user* telephone B DN 0141037474	**CLS** *Transferred-to user* telephone C DN 0164767620	Originating user's display after receipt of Transferred-to user's transfer notification information	Transferred-to user's display after receipt of originating user's transfer notification information
CNDA DDGD	CNDA DDGD	312-6 T	211-4 T
CNDD DDGD	CNDD DDGD	312-6	211-4

Operating parameters

If the LinkId Request, or the Call Transfer Request to the PSTN is rejected, the Meridian 1 does not take any action.

The EuroISDN Call Transfer supplementary Service is not supported on the EuroISDN master mode interface.

This feature depends on the following Meridian 1 hardware:

- ISDN Primary Rate Interface
  - — 2 Mb Primary Rate Access card (NT8D72BA) for layer 1 interface on Options 51C, 61C, and 81C
  - — 2 Mb Primary Rate Access card (NTBK50) for layer 1 interface on the Option 11C
  - — The downloadable DCH daughterboard (NTBK51) card is required on the Option 11C
  - — The Dual PRI pack (NTCK43)
  - — The clock controller card (NTAK20BA/BB) for the Option 11C

  - — MSDL card (NT6D80AA) on Options 51C, 61C, and 81C
  - — Clock Controller (QPC775E) for large systems
- ISDN Basic Rate Interface
- SILC card (NT6D70BA) for layer 1 interface
- MISP card (NT6D73AA) on Options 51C, 61C, and 81C
- MISP card (NTBK22AA) on the Option 11C

Feature interactions

Call Detail Recording (CDR)

For invocation of Explicit Call Transfer within the public network, CDR tickets issued do not reflect the complete duration of the call to the transferred-to telephone.

When Call Transfer is completed on an established call, an S (Start) record is generated for each calling party involved at the time Call Transfer was activated. After the call is terminated, an E (End) record is generated showing its final disposition. Start and End records are generated at the Transferring node.

If more than one transfer occurs, an X (Transfer) record is generated for each transfer when the primary call involved a CDR-X call. If N transfers occurs, (N-1) records are generated in addition to the Start and End records.

When a EuroISDN gateway is used, the BLID field is updated with the Call Transfer Notification information received at the Transferring node.

In a stand-alone situation, when only the served user A is on the Meridian 1, no notification is received. There is always one incoming call, and one outgoing call, because it is not possible to transfer an incoming DID call over an outgoing DID call. When a transferred call is released, the BLID field of the E record is filled with the Redirection number sent on the outgoing side of the transfer.

Networking feature interactions

BNE/EuroISDN Name and Private Number display

BNE Name and Private number information can not be carried out in EuroISDN Explicit Call Transfer Notifications. If an incoming EuroISDN call with the BNE name information and the private CLID is being forwarded through EuroISDN, after Call Transfer occurs, the BNE information name and number are replaced on the display and the notification numbers provided by the Explicit Call Transfer feature.

BNE/EuroISDN Call Diversion

There is no interaction with this feature.

Auxiliary product interactions

Meridian Link

Unsolicited Status Message (USM)

When an ACD agent is transferred over a EuroISDN link, a USM message is sent to the Meridian link.

Meridian Mail

A caller transferred to Meridian Mail through EuroISDN can access Meridian Mail functionalities such as message reception and mailbox interrogation.

Feature packaging

The Business Networking Express/EuroISDN Explicit Call Transfer and Gateways feature requires the following package(s):

- Business Networking Express (BNE) package 367

The Business Networking Express/EuroISDN Explicit Call Transfer and Gateways feature is dependent on the following packages:

- Call Party Name Display (CPND) package 95
- Primary Rate Access (PRA) package 146
- 2.0 Mb Primary Rate Interface (PRI2) package 154
- ISDN Supplementary Features (ISDN INTL SUP) package 161
- International Primary Rate Access (IPRA) package 202

- Basic Rate Interface (BRI) 216
- Multipurpose Serial Data Link (MSDL) package 222
- ISDN BRI Trunk Access (BRIT) 233
- EuroISDN (EURO) package 261
- Business Networking Express (BNE) package 367

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 10 – Configure an Analog (500/2500 type) telephone for EuroISDN Call Transfer.

2 LD 11 – Configure a Meridian 1 proprietary telephone for EuroISDN Call Transfer.

3 LD 95 – Configure the Call Transfer Reason for Redirection Code.

4 LD 17 – Configure EuroISDN Call Transfer on PRI2.

5 LD 16 – Configure EuroISDN Call Transfer on BRI trunk.

LD 10 – Configure an Analog (500/2500 type) telephone for EuroISDN Call Transfer.

Prompt	Response	Description
REQ:	CHG	Change.
TYPE:	500	Analog (500/2500 type) telephone.
TN	l s c u c u	Terminal Number. For Option 11C.
DN	x..x	Directory Number.
...	...	
CLS		Class of Service.
	XFA	Call Transfer Allowed
	DDGA	DN Display on the other telephone allowed (default) DDGD = DN Display on the other telephone denied

LD 11 – Configure a Meridian 1 proprietary telephone for EuroISDN Call Transfer.

Prompt	Response	Description
REQ:	CHG	Change.
TYPE:	aaaa	Telephone type
TN	l s c u c u	Terminal Number. For Option 11C.
...	...	
CLS		Class of Service.
	XFA	Call Transfer Allowed
	DDGA	DN Display on the other telephone allowed (default) DDGD = DN Display on the other telephone denied
	CNDA	Calling Name Display Allowed CNDD = Calling Name Display Denied (default)
		Note: There is no name sent on EuroISDN, but this must be configured to display the Reason for Redirection Code.

LD 95 – Configure the Call Transfer Reason for Redirection Code.

Prompt	Response	Description
REQ	NEW CHG	New. Change.
TYPE	CPND	Call Party Name Display.
...	...	
RESN	YES	Allow display of Reason for Redirection Codes.
XFER	aaaa (T)	Mnemonic for Call Transfer display.
...	...	

LD 17 – Configure EuroISDN Call Transfer on PRI2.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	ADAN	ADAN Data Block.
ADAN	 NEW aaa x CHG aaa x	Action Device and Number. Add I/O device. Where: aaa = type, x = port Change I/O device. Where: aaa = type, x = port
...	...	
IFC		Interface type for D-channel.
	E403 EURO	EuroISDN interface for ETS 300 403. EuroISDN interface.
...	...	
CNTY	xxxx	Country. ***Note:*** Countries that support the E403 interface.
...	...	...
RCAP	 CTO ECTO	Remote Capabilities. Add Call Transfer notification. Add Call Transfer notification and invocation. XCTO = Remove Call Transfer notification (CTO) or Call Transfer notification and invocation (ECTO) ***Note:*** CTO and ECTO can not be configured together.

LD 16 – Configure EuroISDN Call Transfer on BRI trunk.

Prompt	Response	Description
REQ	NEW CHG	Add new data block. Change existing data block.
TYPE	RDB	Route Data Block.
DTRK	YES	Digital Trunk Route. No = default
DGTP	BRI	Basic Rate Interface.

...	...	
IFC		Interface type for D-channel.
	E403 EURO	EuroISDN interface for ETS 300 403. EuroISDN interface.
...	...	
CNTY	xxxx	Country. ***Note:*** Countries that support the E403 interface.
...	...	...
RCAP		Remote Capabilities.
	CTO ECTO	Add Call Transfer notification. Add Call Transfer notification and invocation. XCTO = Remove Call Transfer notification XECTO = Remove Call Transfer notification and invocation ***Note:*** CTO and ECTO can not be configured together.

Feature operation

Refer to the Call Transfer feature described in the *Features and Services* (553-3001-306).

Business Networking Express/Name and Private Number Display

Contents

The following are the topics in this section:

Regional material statement 359
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Reference list

The following are the references in this section:

- *Features and Services* (553-3001-306)

Regional material statement

ISDN BRI trunking is not available in North America. Contact your system supplier or your Nortel Networks representative to verify support of this product in your area.

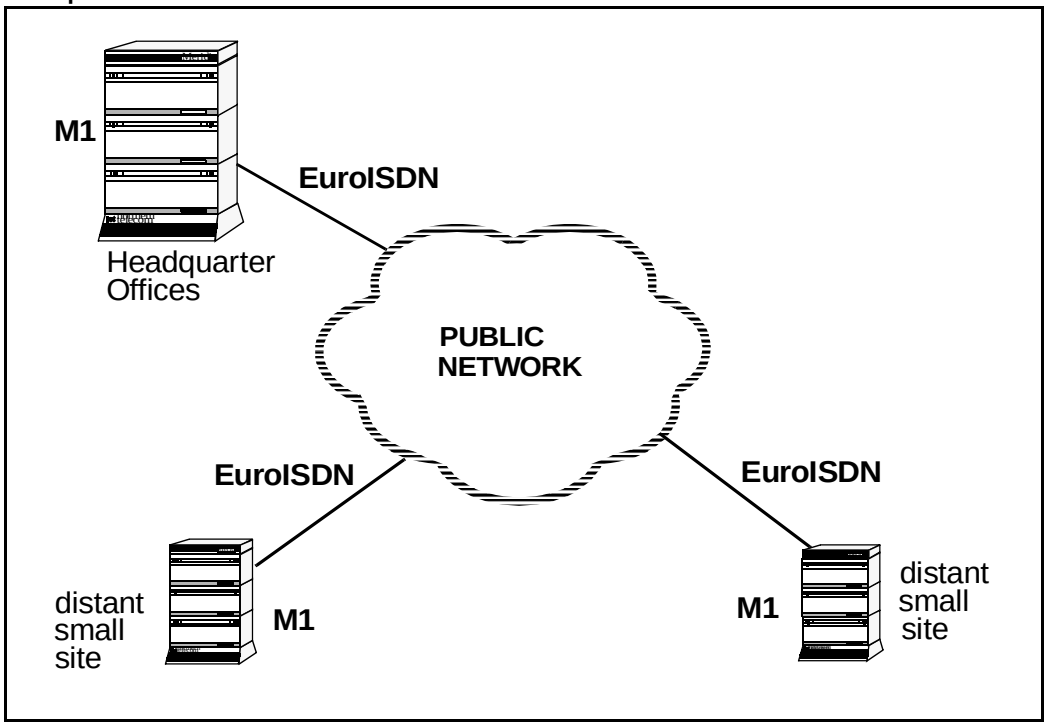
Feature description

Business Networking Express (BNE) is a term that refers to a group of different EuroISDN network functionalities. The BNE capabilities provide Meridian 1 systems that are connected on a EuroISDN public network with the following functionalities:

- EuroISDN Call Completion
- EuroISDN Name and Private Number Display
- EuroISDN Call Diversion
- EuroISDN Explicit Call Transfer

BNE provides a Virtual Private Network (VPN) solution for Meridian 1 systems through the EuroISDN public network. BNE is appropriate for companies that require a network that operates as if it is a private network, but has an affordable start-up cost. The pre-existing Virtual Network Services (VNS) solution provides more features than BNE (VNS is a version of the ISL interface); however, VNS requires a leased line for the D-channel between the Meridian 1 systems.

Figure 35
Example of a network where BNE is useful



With BNE implemented, when a user dials a private network number to reach a user at another Meridian 1 site through the public network, the ESN software causes the dialed number to be outpulsed as a public number. The BNE software inserts the Calling Name and the Private CLID in the User-to-User Information Element (IE) carried by the SETUP message.

At the destination switch, the Private CLID is displayed, along with the Calling Name, on the alerted telephone. The name associated with the alerted telephone is delivered to the calling user in a User-to-User IE carried in the ALERT message and displayed on the calling telephone.

When the call is answered, the Connected Name and the private Connected Number is provided to the calling user in a User-to-User IE carried in the CONNECT message.

Consistent with MCDN and QSIG networking, the letter H is displayed in front of the private number.

You can implement restrictions on displaying the name and number of the calling, called, or connected party.

The information presented here deals with the Name and Private Number Display parts of the BNE package.

The Name and Private Number Display parts use the User-to-User Information Element (IE) defined in the EuroISDN basic call standards (ETS 300 102-2 and EN 300 403-1) and the implicit User-to-User service 1, (defined in ETS 300 284 and ETS 300 286-1), to carry user-defined signaling.

For information about the other parts of the BNE package, refer to the *Business Network Express/EuroISDN Call Diversion and Business Network Express/EuroISDN Explicit Call Transfer* feature modules in this book.

Name Display on EuroISDN

This functionality is based on the existing MCDN and QSIG Call Party Name Display (CPND) and Display of Calling Party Denied (DPD) features. The following three services are supported.

1. Calling Name Identification Presentation (CNIP)

CNIP is a supplementary service which provides the called user with the calling user's name. This service is permanent and based on the Class of Service of the telephone originating the call.

- For BRI telephones, set PRES to YES in LD 27.
- For all other telephones, configure NAMA in the Class of Service in LD 10 and LD 11.
- For attendants, the CNIP service is always provided; it is not configurable.

CNIP does not deliver the calling user's name to the called user if:

- the Calling Party Name is not available. This occurs when a name is not configured in the CPND data block for the calling party DN, or in the case of interworking.
- presentation is restricted for the telephone originating the call, as controlled by the CNIR service.

CNIP — EuroISDN/MCDN Gateway

On reception of a call coming from an MCDN network, with the calling user's name information routed to the PSTN network, the calling name is sent through EuroISDN to the destination node (if the EuroISDN route list block supports BNE).

On reception of a EuroISDN call with the calling user's name information routed to the MCDN network, the gateway node delivers the calling user's name information to the MCDN network.

CNIP — EuroISDN/QSIG Gateway

On reception of a call coming from a QSIG network with the calling user's name information, and routed to the PSTN network, the calling name is sent through EuroISDN to the destination node (if the EuroISDN route list block supports BNE).

On reception of a EuroISDN call, with calling user's name information routed to the QSIG network, the gateway node delivers the calling user's name information to the QSIG network.

CNIP — EuroISDN/DPNSS Gateway

DPNSS does not support name display.

2. Connected Name Identification Presentation (CONP)

This is a service offered to the calling user. CONP provides the calling user with the alerted/connected user's name. CONP service also delivers:

- the name of the alerted user to the calling user whenever the called user's telephone starts ringing
- the name associated with the telephone that answers the call

The Alerting/Connected Name information is included in the User -to-User IE and carried in the ALERTING/CONNECT message.

When an Alerting/Connected Name is received with a "presentation allowed" setting, it is displayed on telephones or attendant consoles equipped with displays.

This service is permanent and based on the Class of Service on the telephone receiving the call:

- For BRI telephones, set PRES to YES in LD 27.
- For all other telephones, set NAMA in the CLS in LD 10 and LD 11.
- For attendants, the CONP service is always provided; it is not configurable.

CONP does not deliver the called user's name to the calling user if:

- the Called Party Name is not available. This occurs when a name is not configured in the CPND data block for the called party DN, or in the case of interworking.
- presentation is restricted for the terminating telephone as controlled by the CNIR service.

CONP — EuroISDN/QSIG Gateway

The QSIG network receives the connected (or alerting) user's name from the BNE feature. The connected (or alerting) user's name provided by the QSIG network is sent over EuroISDN to the originator of the call.

CONP — EuroISDN/MCDN Gateway

The connected (or alerting) user's name provided by the MCDN network is sent over EuroISDN to the originator of the call.

Note: The alerted name carried in the NOTIFY message (RCAP = ND2) is not provided to the originator because UUS1 doesn't define any message to tandem this information.

The connected (or alerting) user's name delivered by the BNE feature is sent to the MCDN network.

CONP — EuroISDN/DPNSS Gateway

DPNSS does not support name display.

3. Calling/Connected Name Identification Restriction (CNIR)

This service prevents the user's name from being presented to another user. This service is activated in two ways:

- **for all calls.** It is based on the Display of Calling Party Denied feature. The Calling/Connected/Called/Alerting Name is denied or allowed using the Class of Service.
  - — – For BRI telephones, set PRES to NO in LD 27. Do not enter a name for the default DN in LD 27.
  - — – For all other telephones, set NAMD in the Class of Service in LD 10 and LD 11
  - — – For attendants, the CNIR service is not supported
- **for each call** (Class of Service NAMA and the user dials the Calling Party Privacy Flexible Feature Code when initiating a call). The Calling Number and Name is restricted when the user dials the CPP code. Attendants can dial the CPP code for CNIR.

Display of restricted name

If the Calling Name information is received with a "presentation restricted" setting, then Xs are displayed on the called user's display, if it is able and authorized to receive the Calling Name information. If the called user's name information is received in the ALERTING message and its presentation is restricted, then Xs are displayed on the calling user's display, if it is able and authorized to receive name information. If the connected user's name information is received in the CONNECT message and its presentation is restricted, then Xs are displayed on the calling user's display, if it is able and authorized to receive name information.

CNIR — EuroISDN/QSIG Gateway

When a user invokes the CNIR service, the calling, alerting, and connected names are marked as “presentation is restricted”, and this indication is passed to the other network.

CNIR — EuroISDN/MCDN Gateway

When a user invokes the CNIR service, the calling, alerting, and connected names are marked as “presentation is restricted”, and this indication is passed to the other network.

CNIP — EuroISDN/DPNSS Gateway

DPNSS does not support name display.

Private Calling Number on EuroISDN

EuroISDN public networks can support the same private Calling Number capabilities as QSIG and MCDN networks, with the BNE/Name and Private Number Display feature implemented on the Meridian 1 systems.

This functionality delivers a Calling Party Number in a private format (based on a Coordinated Dialing Plan or Uniform Dialing Plan numbering plan) in addition to the public-format Calling Party Number. The public-format number is delivered in the Calling Number IE. The BNE software is responsible for delivering the private number in the User-to-User IE. The Connected Number IE is provided by the Central Office in a public format but the private Connected Number is displayed on the calling user’s telephone.

The private format depends on the numbering plan the caller used to dial the call.

The private calling number is constructed based on the CLID Enhancement feature. It contains the following information:

- numbering plan field (private)
- type of number field (CDP or LOC or unknown)
- the DN digits of the calling telephone prefixed by an LSC (CDP) or HLOC (UDP), if configured
- presentation flag to allow or deny the display on the called user’s telephone

The following two services are supported:

1. Calling Line Identification Presentation (CLIP)

CLIP provides the called party with the identification of the calling party in a form that allows the called party to return the call, if desired, using the VPN network built on the public EuroISDN connections. The CLIP option is configured in the telephone set programming as follows:

- BRI telephones: use PRES, CLIP and TRANS in LD 27
- other telephones: Class of Service DDGA in LD 10 and LD 11
- attendant: CLIP is always provided; it is not configurable

CLIP — EuroISDN/MCDN gateway

On reception of a call coming from MCDN network with a private calling number and routed to the PSTN network, the private calling number is sent through EuroISDN to the destination node by the BNE feature.

On reception of a EuroISDN call with a BNE private calling number routed to the MCDN network, the gateway node uses the calling number delivered by the BNE feature to build the CLID IE sent over MCDN.

CLIP — EuroISDN/QSIG Gateway

On reception of a call coming from a QSIG network, with a private calling number and routed to the PSTN network, the private calling number is sent through EuroISDN to the destination node by the BNE feature.

On reception of a EuroISDN call, with a BNE private calling number routed to the QSIG network, the gateway node uses the calling number delivered by the BNE feature to build the CLID IE sent over QSIG.

CLIP — EuroISDN/DPNSS Gateway

On reception of a call coming from a DPNSS network, with a private calling number (OLI) and routed to the PSTN network, the private calling number is sent through EuroISDN to the destination node by the BNE feature.

On reception of a EuroISDN call, with a BNE private calling number routed to the DPNSS network, the gateway node uses the calling number delivered by the BNE feature to build the OLI sent over DPNSS.

'H' is not displayed in the private number on the DPNSS side, according to the existing DPNSS gateway.

2. Calling Line Identification Restriction (CLIR)

This service enables the calling party to prevent presentation of the calling number on the called user's telephone. There are two options for implementation:

- **presentation restricted for all calls:** define DDGD in the Class of Service of the telephone. CLIR is not supported for attendant consoles. For BRI telephones use the CLIP, PRES and TRANS prompts in LD 27.

Table 38
Reception of CLID on BRI telephone

CLIP	TRANS	presentation of the calling number IE	CLID IE transmitted to the called BRI telephone
YES	YES	allowed	transparent
YES	YES	restricted	transparent
YES	NO	allowed	transparent
YES	NO	restricted	calling number digits are removed from the IE, but the "empty" CLID field is still sent
NO			CLID IE is not sent

- **presentation restricted for individual calls:** the user dials the Calling Party Privacy (CPP) Flexible Feature Code. Define DDGA in the Class of Service of the telephone.

Class of Service CLBA/CLBD (Calling Party Number and Name per-line blocking allowed or denied): On a permanent basis, the Calling Number and Name can be restricted using the CLBA Class of Service in LD 10 and LD 11 (not applicable to BRI telephones). If you program CLBD, the user can dial the CPP code for blocking of name and number for individual calls. Users of BRI telephones cannot dial the CPP code to block name and number; they must use a presentation soft key.

CLIR — EuroISDN/QSIG Gateway

When the CLIR service is invoked, the calling number is marked as “presentation is restricted”, and this indication is passed to the other network.

CLIR — EuroISDN/MCDN Gateway

When the CLIR service is invoked, the calling number is marked as “presentation is restricted”, and this indication is passed to the other network.

CLIR — EuroISDN/DPNSS Gateway

The CLIR service is not supported on DPNSS. Upon receiving the calling number from DPNSS, it is marked as "presentation is unrestricted" and then passed to the EuroISDN side.

If a calling number marked as "presentation restricted" is received from the EuroISDN side, it is passed to the DPNSS side without the possibility of indicating "presentation restriction". Therefore, the calling number will display.

Private Connected Number on EuroISDN

EuroISDN public networks can support the same private Connected Number capabilities as QSIG and MCDN networks, with the BNE/Name and Private Number Display feature equipped on the Meridian 1 systems.

This functionality delivers a Connected Number in a private format (CDP or UDP numbering plan) in addition to the public-format Connected Number. The public-format number is delivered in the Connected Number IE. The BNE software is responsible for delivering the private Connected Number to the calling party in the User-to-User IE. The Connected Number IE is provided by the Central Office in a public format but the private Connected Number is displayed on the calling user’s telephone.

The private Connected Number is delivered to the calling user only if a private Calling Number was provided from the calling user. The format depends on the numbering plan of the received private CLID.

The private Connected Number contains the following information:

- numbering plan field (private) - depends on the NPI of the received CLID
- type of number (TON) field (CDP or LOC or unknown) - depends on the TON of the received CLID

- the DN digits of the connected telephone prefixed by an LSC (CDP) or HLOC (UDP), if configured
- presentation flag to allow or deny the display on the calling user's telephone

Two different services are supported:

1. Connected Line Identification Presentation (COLP)

This service allows the calling party to receive identification of the connected party. The Connected Number replaces the dialed number on the display of the calling telephone. If the called party has presentation restriction, using the COLR supplementary service, the private Connected Number field is empty or presented with the presentation restriction flag on (to users with an override category). The attendant DN is sent when the call is answered by the attendant.

Note: BRI telephones and attendant consoles can have an override key.

The COLP option is configured for telephones as follows:

- BRI telephones: use COLP and TRANS in LD 27 for each DN
- other telephones: Class of Service DDGA in LD 10 and LD 11
- attendant: COLP is always provided; it is not configurable

COLP — EuroISDN/QSIG Gateway

The connected number, delivered by the BNE feature, is sent to the QSIG network. The connected number, provided by the QSIG network, is sent over EuroISDN to the originator of the call.

COLP — EuroISDN/MCDN Gateway

The connected number, delivered by the BNE feature, is sent to the MCDN network. The connected number, provided by the MCDN network, is sent over EuroISDN to the originator of the call.

Note: The connected number is provided by the MCDN network only in the case of call diversion.

COLP — EuroISDN/DPNSS Gateway

The connected number, delivered by the BNE feature, is sent to the DPNSS network. The connected number, provided by the DPNSS network, is sent over EuroISDN to the originator of the call.

'H' is not displayed in the private number on the DPNSS side, in accordance with the existing DPNSS gateway.

2. Connected Line Identification Restriction (COLR)

This service enables the connected party to prevent presentation of its number on the calling user's telephone. There are two options for implementation:

- presentation allowed: the allowed option is set in the CONNECT message. The calling user is presented with the Connected Number.
- presentation restricted: the restricted option is set in the CONNECT message. The Connected Number is always provided to the network. If the calling user has an "override" category, the network passes this Connected Number to it. If not, the Connected Number is not available to the calling user.

The COLR option is configured for telephones as follows:

- other telephones: Class of Service DDGD in LD 10 and LD 11

- attendant: COLR is not provided
- BRI telephones: Table 39 summarizes the possibilities:

Table 39
Reception of COLP on BRI telephones

COLP	TRANS	presentation of the Connected Number IE	COLP IE transmitted to the calling BRI telephone
YES	YES	allowed	transparent
YES	YES	restricted	transparent
YES	NO	allowed	transparent
YES	NO	restricted	connected number digits are removed from the IE, but the “empty” COLP field is still sent to the telephone
NO			connected number IE is not passed to the telephone

Note: The same rules are used for the public Connected Number, if no private Connected Number is received.

COLR — EuroISDN/QSIG Gateway

When the COLR service is invoked, the connected number is marked as “presentation is restricted”, and this indication is passed to the other network.

COLR — EuroISDN/MCDN Gateway

When the COLR service is invoked, the connected number is marked as “presentation is restricted”, and this indication is passed to the other network.

COLR — EuroISDN/DPNSS Gateway

The COLR service is not supported on DPNSS. Upon receiving the connected number from DPNSS, it is marked as "presentation is unrestricted" and then passed to the EuroISDN side.

If a connected number marked as "presentation restricted" is received from the EuroISDN side, it is passed to the DPNSS side without the possibility of indicating "presentation restriction". Therefore, the connected number will display.

Operating parameters

The hardware requirements for BRI Trunk (BRIT) access are:

- NT6D73AA MISP
- NT6D70BA SILC
- NT6D71AA UILC

The hardware requirements for PRI2 are:

- 2.0 Mb NT8D72 PRI card with either one of the following cards for handling the D-channel:
  - NT6D11 DCHI card
  - NT6D80 MSDL card
- 2.0 Mb NTCK43 dual-port DTI/PRI card with one of the following cards for handling the D-channel:
  - NT6D11 DCHI card
  - NT6D80 MSDL card
  - NTBK51 Downloadable D-channel daughter board

For BNE functionality to work, the public network must support User-to-User service 1 implicit procedures. The Meridian 1 node at the terminating end must support the BNE/Name and Private Number Display feature. Configure PSTN routes in Route List Indexes to these destinations with the BNE feature activated (BNE = YES). For calls to Meridian 1 nodes that do not support the feature, use the default setting (BNE = NO) on PSTN routes in the Route List Indexes.

CDP or UDP numbering plans must be used. Trunk route access codes are not supported. CDP or BARS or NARS software must be equipped.

The maximum length of names carried by the BNE feature is 27 characters (maximum length allowed by the CPND feature). Other factors that can affect the number of characters displayed are the size of the display on the telephone and the display of the charges. Names are truncated if their length exceeds 18 characters.

Basic Rate Interface (BRI) telephones cannot have names displayed but they can send a name to a called telephone.

If the called telephone is busy, BNE/Name and Private Number Display does not operate.

When the Call Transfer and Conference features are used, the BNE feature does not provide to the caller the name and number associated with the remote telephone. This happens because the User-to-User service 1 only uses SETUP, ALERT and CONNECT messages to convey user signaling.

Most of the options for BRI telephones are configured on the telephone and not the Meridian 1. The BNE/Name and Private Number Display feature does not introduce any new Classes of Service or configurable data related to the telephone. The Classes of Service are used by the BNE feature in the same way they are used on EuroISDN or QSIG networks for Calling Number IE or Name display information. Some BRI telephones cannot handle the presentation flag in the Calling Number IE. With the prompt TRANS, you can remove the digits in the CLID sent to the BRI telephone when the presentation is restricted. For Calling Line Identification Restriction (CLIR), if the BRI telephone provides a presentation indication in the CLID information, the PRES option is not used in LD 27. In all other cases, the presentation flag is set based on the PRES configuration. If no CLID is provided by the BRI telephone, the default DN of the Terminal Service Profile (TSP) is used. The same rules are used for the public Calling Number, if no private Calling Number is received.

When you configure the D-channel in LD 17 for PRI, LD 16 for BRI (respond UUS1 to the RCAP prompt), it means:

- the Meridian 1 decodes incoming User-to-User IEs for calls terminating locally or originating from this node, if the BNE package is equipped
- the Meridian 1 is allowed to send User-to-User IEs to the public network

Feature interactions

CNIR and CNIP/CONP

The CNIR supplementary service takes precedence over the CNIP supplementary service.

The CNIR supplementary service takes precedence over the CONP supplementary service.

COLR and COLP

The COLR supplementary service takes precedence over the COLP supplementary service.

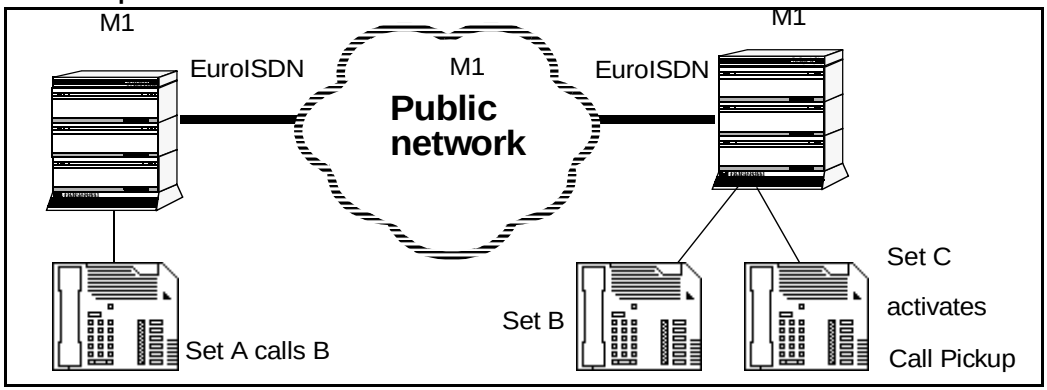
CLIR and COLR

The same Class of Service controls the CLIR and COLR services. If a user has presentation restricted configured, the number is sent to the other party with the presentation flag set to restricted for incoming and outgoing calls.

Call Pickup

Refer to Figure 36. If telephone A at one node calls telephone B at another node but telephone C activates Call Pickup, the name and private number associated with telephone A are displayed on telephone C, according to the presentation programming of telephone A. The display of telephone A shows the name and private number associated with telephone B while telephone B is ringing, if the presentation is allowed. Telephone A is updated with name and Connected Number information when a user at telephone C answers.

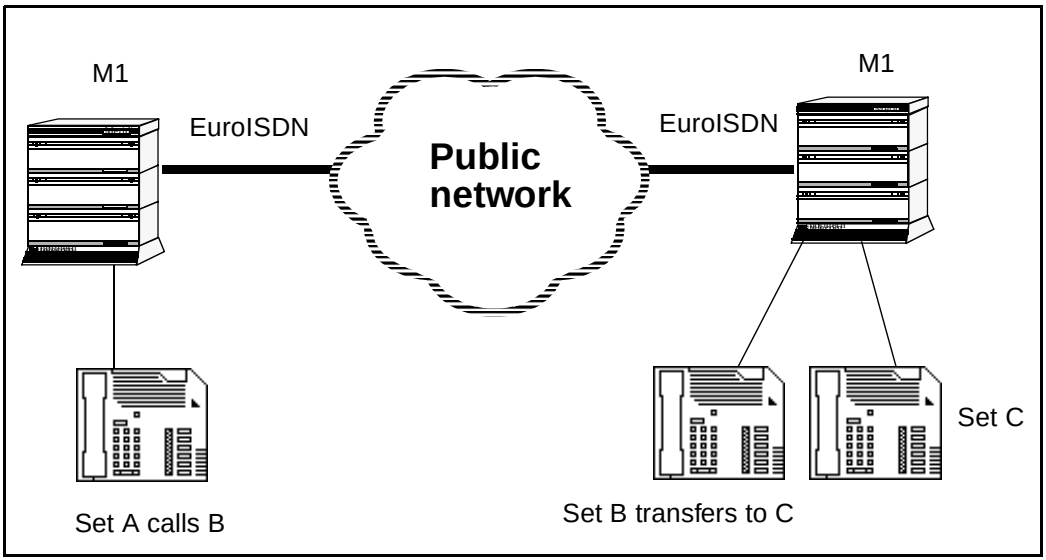
Figure 36
Call Pickup in a EuroISDN network



Call Transfer

Refer to Figure 37 for an illustration of a local Call Transfer. Refer to Figure 38 for an illustration of an external Call Transfer. Note that in these illustrations, Explicit Call Transfer is not activated.

Figure 37
Local Call Transfer



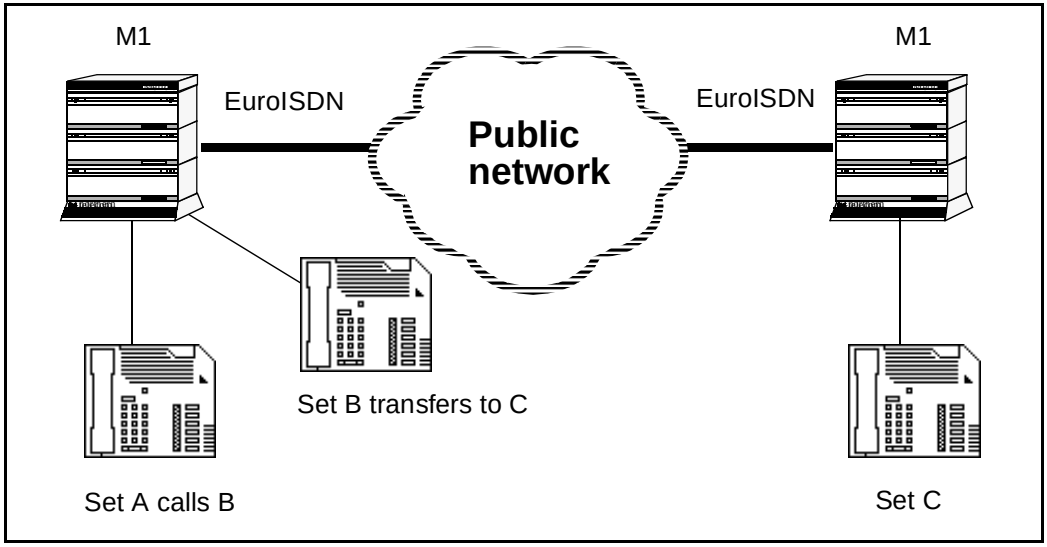
Transfer on ringing (internal)

Figure 37 illustrates a local transfer of an incoming EuroISDN call that has BNE Name information and a private CLID. For this discussion, assume the user transfers the call while telephone C is ringing. When the Call Transfer is completed, the name and private number associated with telephone A, display on telephone C, according to the presentation programming of telephone A. Telephone A shows the name and number associated with telephone B.

Transfer after answer (internal)

Figure 37 illustrates a local transfer of an incoming EuroISDN call that has BNE Name information and a private CLID. For this discussion, assume the user transfers the call after a user at telephone C answers. When the Call Transfer is completed, the name and private number associated with telephone A display on telephone C, according to the presentation programming of telephone A. Telephone A shows the name and number associated with telephone B.

Figure 38
External Call Transfer



Transfer on ringing (external)

Figure 38 illustrates the transfer of a local call over the EuroISDN network to telephone C. For this discussion, assume the user transfers the call while telephone C is ringing. When the Call Transfer is completed, and while telephone C is ringing, the displays do not change. When the user at telephone C answers, the user's name and number associated with telephone C display on telephone A, according to the presentation programming of telephone C. Telephone C shows the name and private number of telephone B.

Transfer after answer (external)

Figure 38 illustrates the transfer of a local call over the EuroISDN network to telephone C. For this discussion, assume the user transfers the call after the user at telephone C answers. When the Call Transfer is completed, the displays do not change; the user's name and number associated with telephone B display on telephone A. Telephone C shows the name and private number associated with telephone B.

Conference

Figure 39 illustrates a conference call involving parties connected through a EuroISDN network.

Figure 39
Local Conference

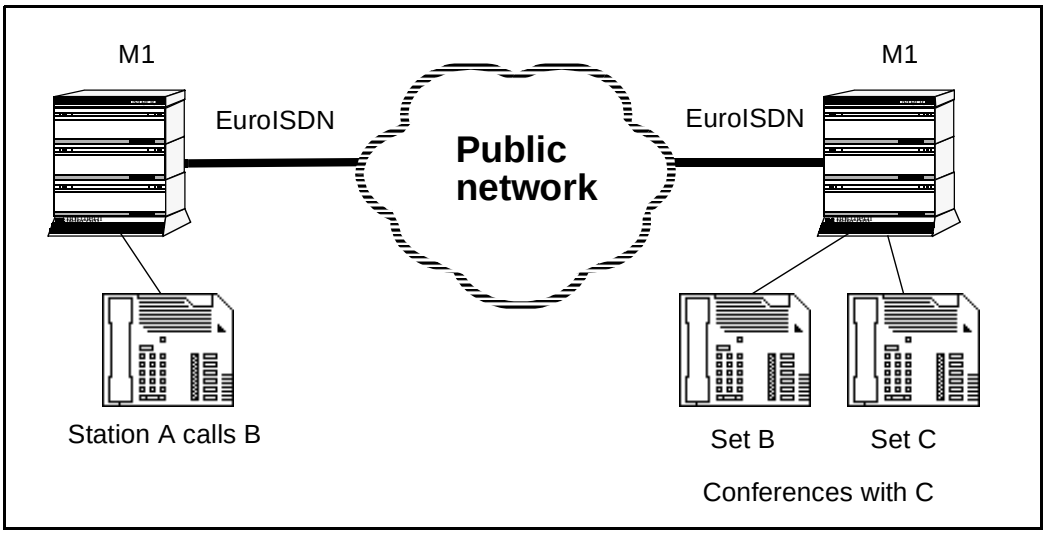
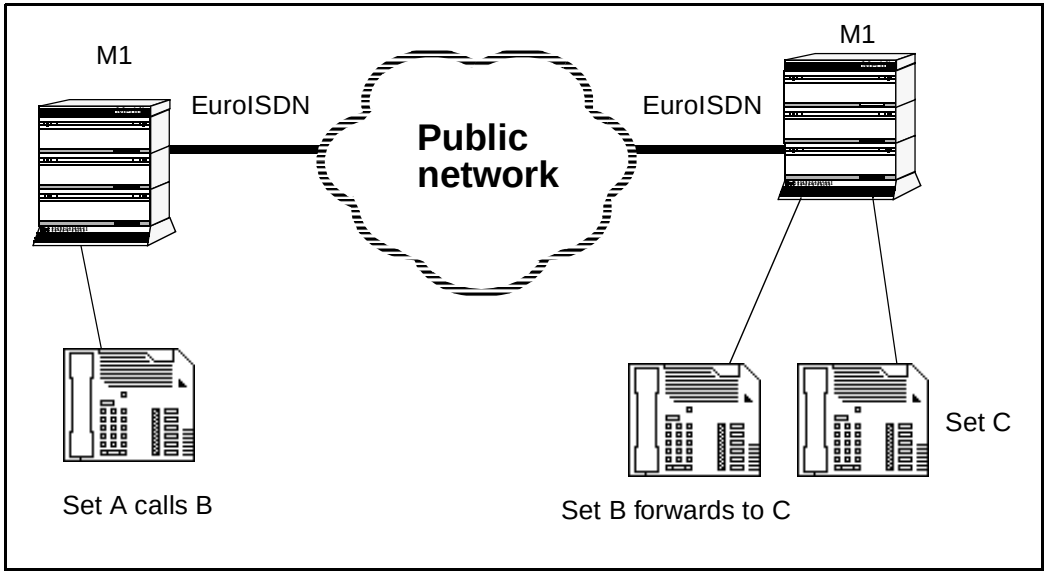


Figure 39 illustrates an incoming EuroISDN call that has BNE Name information and a private CLID which is conferenced locally. If telephone B drops out of the conference call, the user's name and private number associated with telephone A display on telephone C, if the presentation is allowed, but the display on telephone A does not change.

Call Forward

Figure 40 illustrates a local Call Forward situation involving parties connected through a EuroISDN network. Figure 41 illustrates an external Call Forward situation involving parties connected through a EuroISDN network. Note that in this illustration, Explicit Call Transfer is not activated.

Figure 40
Local Call Forward



Call Forward All Calls (internal)

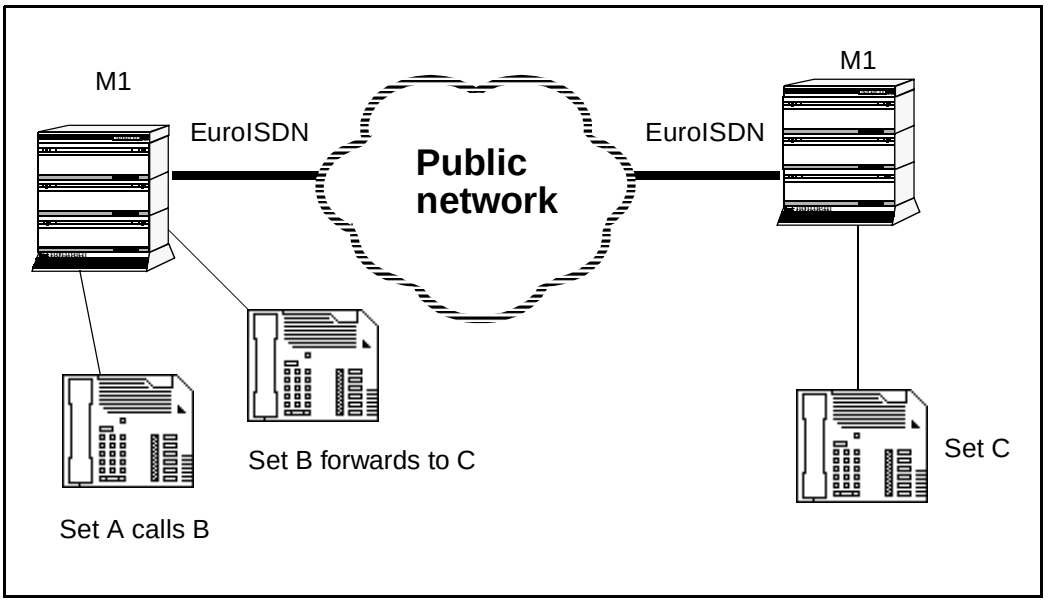
Figure 40 illustrates an incoming EuroISDN call that has BNE Name information and a private CLID which forwards all calls to a local telephone. While telephone C is ringing, telephone A shows the name and number associated with telephone C. The name and number associated with telephone A display on telephone C, according to the presentation programming of telephone A.

Call Forward No Answer (internal)

Figure 40 illustrates an incoming EuroISDN call that has BNE Name information and a private CLID which forwards calls on a no answer condition to a local telephone.

After the call forwards, and while telephone C is ringing, the display on telephone A shows the name and private number associated with telephone B. The name and number associated with telephone A display on telephone C, according to the presentation programming of telephone A. When the user at telephone C answers, telephone A shows the name and number associated with telephone C. The display on telephone C does not change.

Figure 41
External Call Forward



Call Forward All Calls (external)

A local call can forward over a EuroISDN network, as shown in Figure 41. While telephone C is ringing, telephone A shows the name and number associated with telephone C. The name and number associated with telephone A are displayed on telephone C, according to the presentation programming of telephone A.

Call Forward No Answer (external)

A local call can forward unanswered calls over a EuroISDN network as shown in Figure 41. After the forwarding occurs, and while telephone C is ringing, telephone A shows the name and private number associated with telephone B. The name and number associated with telephone A are displayed on telephone C, according to the presentation programming of telephone A. When the user at telephone C answers, telephone A shows the name and number associated with telephone C. The display on telephone C does not change.

Hunting/Group Hunt

Figure 42 illustrates a local Hunting situation.

Figure 42
Local Hunting

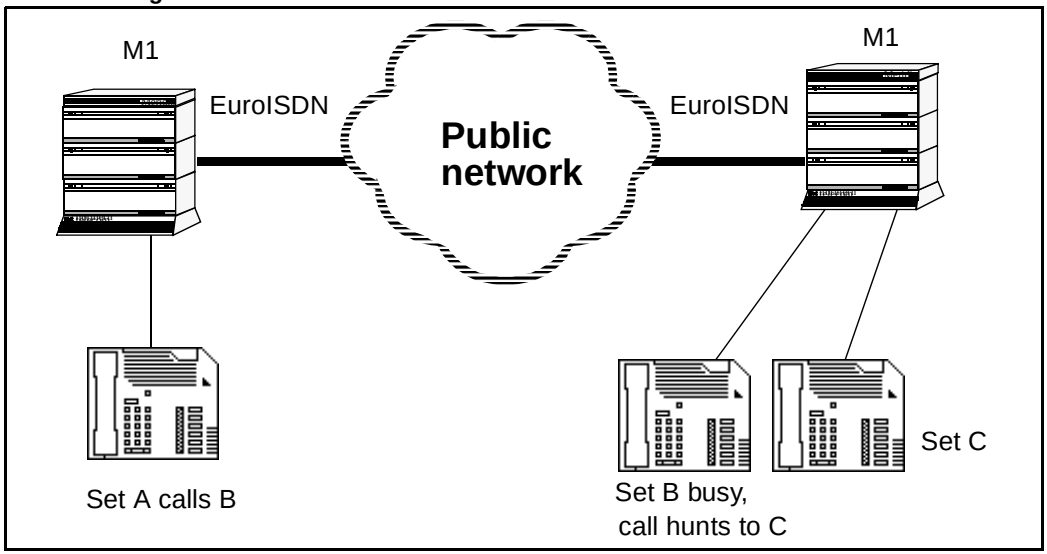
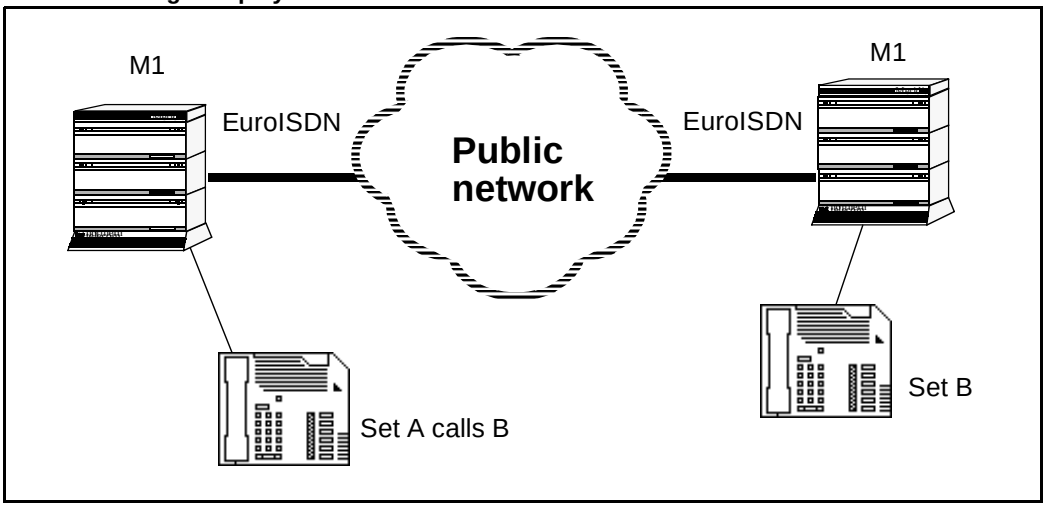


Figure 42 illustrates an incoming EuroISDN call with BNE Name information and a private CLID that redirects to telephone C when telephone B is busy. As soon as telephone C rings, the name and private number associated with telephone A display on telephone C, according to the presentation programming of telephone A. The name and private number associated with telephone C are delivered to telephone A.

Advice of Charge (AOC)

Figure 43 illustrates an example of a situation involving the Advice of Charge feature.

Figure 43
AOC and Charge Display



An outgoing EuroISDN call, carrying BNE signaling, as shown in Figure 43, is charged by the Central Office. If telephone A is a Meridian Modular Digital telephone and AOC Real Time Display is configured, the charge is displayed in the right corner of the first line, when it is received. The display of charge takes precedence over the display of name. The name displayed on telephone A is truncated if there is not enough space to display both the name and the charge.

Display of Access Prefix

The private numbers provided by the BNE feature are displayed with the prefixes configured by the Display of Access Prefix on the CLID feature for a private numbering plan.

Networking feature interactions

Call Diversion (diversion notification sent):

Call Forward All Calls (Call Forward Unconditional)

Figure 44 illustrates an incoming EuroISDN call that has BNE Name information and a private CLID forwarding all calls to telephone C over the EuroISDN network. After the call forwards, the BNE information name and number are replaced by the notification numbers provided by the Call Diversion feature. While telephone C is ringing, telephone A shows the name associated with telephone C.

Call Forward No Answer

Figure 44 illustrates an incoming EuroISDN call that has BNE Name information and a private CLID forwarding unanswered calls to telephone C over the EuroISDN network. After the call forwards, the BNE information name and number are replaced by the notification numbers provided by the Call Diversion feature. Telephone A shows the name associated with telephone C when the call is established.

Figure 44
Call Diversion in networking

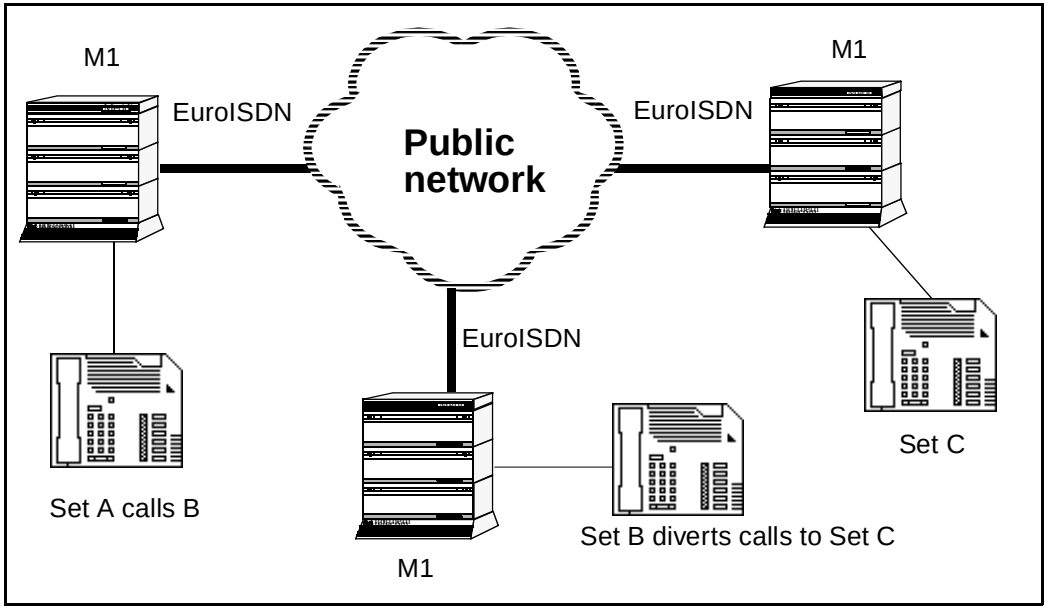
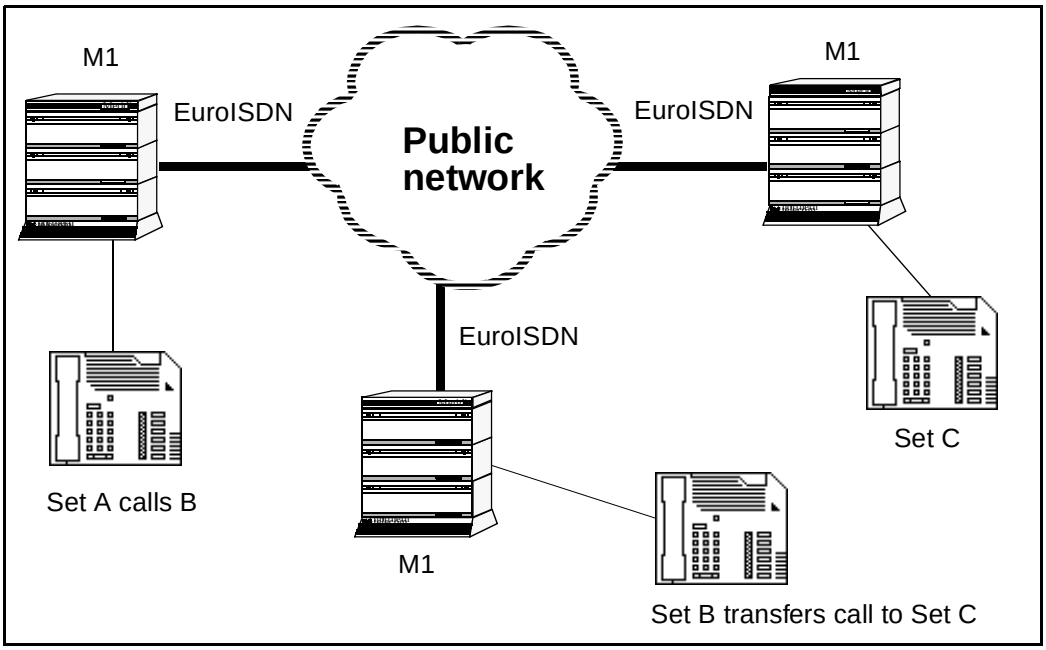


Figure 45
Call Transfer across a network



Explicit Call Transfer (Call Transfer notification sent)

Figure 45 illustrates a Call Transfer across a network. Before the transfer is completed, telephone C shows the name and number associated with telephone B. Telephone A shows the name and number associated with telephone B. After the transfer, the BNE information name and number are replaced by the notification numbers provided by the Call Transfer feature.

Feature packaging

A new package, Business Networking Express (BNE) package 367, is introduced with this feature.

The following software packages are required for Business Networking Express and BRIT:

- Integrated Services Digital Network (ISDN) package 145
- International (INTL) package 161

- Basic Rate Interface (BRI) package 216
- Basic Rate Trunk Application (BRIT) package 233
- EuroISDN (EURO) package 261
- Business Networking Express (BNE) package 367
- and at least one of the following three packages:
  - Coordinated Dialing Plan (CDP) package 57
  - Basic Automatic Route Selection (BARS) package 58
  - Network Alternate Route Selection (NARS) package 59

The following software packages are required for Business Networking Express and PRI2:

- Integrated Services Digital Network (ISDN) package 145
- 2.0 Mb Primary Rate interface (PRI2) package 154
- International (INTL) package 161
- International Primary Rate Access (IPRA) package 202
- Multipurpose Serial Data Link (MSDL) package 222
- EuroISDN (EURO) package 261
- Business Networking Express (BNE) package 367
- and at least one of the following three packages:
  - Coordinated Dialing Plan (CDP) package 57
  - Basic Automatic Route Selection (BARS) package 58
- Network Alternate Route Selection (NARS) package 59

The following software packages are required for Business Networking Express Name Display:

- Call Party Name Display (CPND) package 95
- Flexible Feature Code (FFC) package 139
- Calling Party Privacy (CPP) package 301

The following software packages are required for Business Networking Express Private CLID and COLP:

- Digit Display (DDSP) package 19
- Flexible Feature Code (FFC) package 139
- Calling Party Privacy (CPP) package 301

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 95 – Create a CPND data block.

2 LD 95 – Create a new name string.

3 LD 10 – Allow or deny name and digit display on Analog (500/2500) type telephone.

4 LD 11 – Allow or deny name and digit display on Meridian 1 proprietary telephone.

5 LD 12 – Allow or deny name display on 1250/2250 console.

6 LD 27 – Configure the BRI Digital Subscriber Loop.

7 LD 57 – Assign Flexible Feature Code for Name Display.

8 LD 16 – Configure D-channel for User-to-User service 1 (BRI).

9 LD 17 – Configure D-channel for User-to-User service 1 (PRI).

10 LD 86 – Configure Route List Index for BNE feature.

LD 95 – Create a CPND data block.

Prompt	Response	Description
REQ	NEW	New.
TYPE	CPND	CPND data block.
CUST	xx	Customer group number.
...	...	

LD 95 – Create a new name string.

Prompt	Response	Description
REQ	NEW	New.
TYPE	NAME	Create a new name string.
CUST	xx	Customer group number.
...	...	
DN	xxxx	DN linked with the name string.
...	...	

LD 10 – Allow or deny name and digit display on Analog (500/2500) type telephone.

Prompt	Response	Description
REQ:	NEW CHG	New. Change.
TYPE:	500/2500	Type of telephone.
CUST	xx	Customer group number.
...	...	
FTR	CPND	Allow CPND name assignment on this telephone (not required if CPND is programmed in LD 95).
CLS	CNDA (CNDD)	Allow (deny) user names to be displayed on this telephone.
	NAMA (NAMD)	Allow (deny) name display on the far end.
	DDGA (DDGD)	Allow (deny) digit display on the far end.
	CLBA (CLBD)	Allow (deny) calling number and name per-call blocking.
...	...	

LD 11 – Allow or deny name and digit display on Meridian 1 proprietary telephone.

Prompt	Response	Description
REQ:	NEW CHG	New. Change.
TYPE:	xxxx	Telephone type, where xxxx = SL-1, 2006, 2008, 2009, 2016, 2018, 2112, 2216, 2317, 2616, 3000, 3901, 3902, 3903, 3904, 3905.
CUST	xx	Customer group number.
...	...	
CLS	CNDA (CNDD)	Allow (deny) user names to be displayed on this telephone.
	DNDA (DNDD)	Allow (deny) display on this telephone of the originally dialed telephone's name on redirected calls.
	NAMA (NAMD)	Allow (deny) digit display on the far end.
	DDGA (DDGD)	Allow (deny) calling number and name per-call blocking.
	CLBA (CLBD)	Allow (deny) calling number and name per-call blocking.
...	...	

LD 12 – Allow or deny name display on 1250/2250 console.

Prompt	Response	Description
REQ	NEW CHG	New. Change.
TYPE	 1250 2250	Type of console. M1250 M2250
CUST	xx	Customer group number.
...	...	
CPND	CNDA (CNDD)	Allow (deny) user names to be displayed on this console.
...	...	

LD 27 – Configure the BRI Digital Subscriber Loop.

Prompt	Response	Description
REQ	NEW	New.
TYPE	TSP	Terminal Service Profile.
DSL	l s c dsl c dsl	DSL address. For Option 11C.
...	...	
DN	xxxx	DN associated with the TSP.
...	...	
CLIP	(YES) NO	Calling Line ID presentation service (allowed), denied.
PRES	(YES) NO	Display of party number on far end (allowed), denied.
TRANS	(YES) NO	Party number digits from far end transmitted (not transmitted), if the presentation is restricted.
...	...	

LD 57 – Assign Flexible Feature Code for Name Display.

Prompt	Response	Description
REQ	NEW	New.
TYPE	FFC	Flexible Feature Code.
CUST	xx	Customer group number.
...	...	
CPP	xxxx	Calling Party Privacy feature access code. Four digit maximum. Prompted only if CPP software package is equipped.
...	...	

LD 16 – Configure D-channel for User-to-User service 1 (BRI).

Prompt	Response	Description
REQ	CHG	Change.
TYPE	RDB	Route Data Block.
...	...	
IFC		Interface type.
	EURO	EuroISDN interface - complies with ETS 300 102 ETSI standard.
	E403	EuroISDN interface - complies with ETS 300 403-1 ETSI standard.
...	...	
RCAP	UUS1	User-to-User implicit service 1.
...	...	...

LD 17 – Configure D-channel for User-to-User service 1 (PRI).

Prompt	Response	Description
REQ	CHG	Change.
TYPE	RDB	Route Data Block.
...	...	
IFC		Interface type.
	EURO	EuroISDN interface - complies with ETS 300 102 ETSI standard.
	E403	EuroISDN interface - complies with ETS 300 403-1 ETSI standard.
...	...	
RCAP	UUS1	User-to-User implicit service 1.
...	...	...

LD 86 – Configure Route List Index for BNE feature.

Prompt	Response	Description
REQ	NEW CHG	Add a Route List Index. Change an existing Route List Index.
CUST	xx	Customer group number.
FEAT	RLB	Route List Data Block.
RLI	xxx	Route List Index.
ENTR	xx	Entry number.
...	...	
FSNI		
BNE	YES	Business Networking Express/Name Display, Private CLID and COLP allowed.
	(NO)	Business Networking Express/Name Display, Private CLID and COLP denied.
		BNE prompt appears for EuroISDN routes only.
...	...	

Feature operation

Refer to Calling Party Privacy feature in the *Features and Services* (553-3001-306) for information on the use of the CPP FFC.

Call Charge Keeping

Contents

The following are the topics in this section:

Feature description 393
Operating parameters 394
Feature interactions 394
Feature packaging 394
Feature implementation 394
Feature operation 394

Feature description

On trunk calls between the Meridian 1 and 1TR6 Central Office connection, call charge information can be taken from the ISDN network and used by the Meridian 1 in its call charge records. Accumulated charging information for the call is interfaced with the Meridian 1 Periodic Pulse Metering function, to provide a transparent call-charging feature to the customer.

On the node with a 1TR6 connection, call charge information is received by the Meridian 1 from the network as part of the connect data. This information is temporarily stored by the Meridian 1. Further charge information from the network is added to the charges being stored. When the call has been completed, the information is used to add call charges to the calling user's meter. (The calling user could be a 500/2500-type set, an SL-1 set, an Attendant Console or a trunk in a tandem call.)

Call charging under 1TR6 supports:

- recording of accumulated call charging information for each call in the CDR (if equipped)
- calculation of total charge for each call based on assigned unit cost, and the accumulated call charging information received over the network. (this information is also recorded on CDR)
- attendant access to the accumulation of call charge units, on a per call basis, by way of call marking
- SL-1 telephone set access to MR data (on a set with digit display and an MRK key)
- CDR on Multiple Call Transfer for outgoing calls

Operating parameters

Call charge keeping is only supported between Meridian 1 and 1TR6 Central Office connectivity.

Feature interactions

There are no feature interactions associated with this feature.

Feature packaging

The following packages are required for Call Charge Keeping:

- Call Detail Recording (CDR) package 4;
- Periodic Pulse Metering/Message Registration (MR) package 101; and
- Integrated Services Digital Network (ISDN) package 145.

Feature implementation

There are no specific implementation procedures for this feature

Feature operation

No specific operating procedures are required to use this feature.

Call Connection Restriction

Contents

The following are the topics in this section:

Feature description 395
Operating parameters 396
Feature interactions 396
Feature packaging 396
Feature implementation 397
Task summary list 397
Feature operation 397

Feature description

The Call Connection Restriction product improvement allows limiting conditions to be placed on call connections across the ISDN. Call configurations which would degrade transmission integrity or network performance are prevented.

The following conditions are placed on network call connections:

- No more than one trunk without disconnect supervision can be used in a call connection. Otherwise, trunk lock-up could occur within the network. (This also applies to call-joined connections. Two call connections cannot be joined if each makes use of a trunk without disconnect supervision.)
- Tandem nodes are limited, to prevent potential transmission problems. The maximum number of tandem nodes to be allowed in a call connection can be set between 0 and 31, by way of service change.

- PSTNs can be limited. If so specified, only a single PSTN is permitted in a call connection; or, an unlimited number of PSTNs can be allowed.
- µ/A-Law conversions are limited, to prevent potential transmission problems. The maximum number of conversions to be allowed in a call connection can be set between 0 and 31, by way of service change.
- Satellite delays are limited. The maximum number of Satellite delays to be allowed in a call connection can be set between 0 and 5, by way of service change.

These call limitations will only apply within an ISDN environment. For this product improvement to be effective, ISDN connectivity must be available between the originating and terminating nodes.

Operating parameters

There are no operating parameters associated with this feature.

Feature interactions

With the use of multiple call transfers, conferencing and other manipulations, it is possible to bypass this product improvement's control of the number of unsupervised trunks in a call connection. In these situations, other ISDN call-connection limitations may also be overcome.

The Call Connection Restriction product improvement overrides the Satellite Link Control feature. Whereas the Satellite Link Control feature limited the number of Satellite access lines or intermachine trunks to one, the Call Connection Restriction product improvement allows this limit to be service-changeable.

When calls are joined, it is possible to produce a call connection which violates some of the call-connection restrictions. Under these conditions, it is possible to exceed the limits on tandem nodes, µ/A-Law conversions and network call redirections.

Feature packaging

This feature is included in base X11 System Software.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

LD 15 – Configure the Customer Data Block to allow Call Connection Restriction.

LD 15 – Configure the Customer Data Block to allow Call Connection Restriction.

Prompt	Response	Description
REQ:	CHG	Change existing data block.
TYPE:	NET	Networking data.
CUST	xx	Customer number.
...		
ISDN	YES	Integrated Services Digital Network allowed for customer.
...		
CNTP	LDN	Listed Directory Number.
RCNT	0-(5)	Redirection Count for ISDN calls.
PSTN	(NO) YES	Public Service Telephone Networks.
TNDM	0-(15)-31	Tandem Threshold/Loop Avoidance Limit.
PCMC	0-(15)-31	Pulse Code Modulation Conversions permitted.
SATD	0-(1)-5	Satellite Delays.

Feature operation

No specific operating procedures are required to use this feature.

Call Detail Recording Enhancement

Contents

The following are the topics in this section:

Feature description 400
Call Detail Recording 400
Call Detail Recording Enhancement 400
Operating parameters 401
Feature interactions 401
Feature packaging 410
Feature implementation 411
Task summary list 411
Feature operation 412

Reference list

The following are the references in this section:

- *Call Detail Recording: Description and Formats* (553-2631-100)

Feature description

Call Detail Recording

Call Detail Recording (CDR) records information about selected calls for accounting purposes. For each call, CDR identifies the calling and called parties and notes the time and duration of the call. A record describing the complete call is output by the Meridian 1 system when the call is terminated. The following five recording options are available and can be specified by the customer in any combination for each trunk route:

- all outgoing calls
- all outgoing toll calls
- outgoing answered calls
- outgoing answered toll calls, and
- all incoming calls.

For detailed descriptions of the Call Detail feature, please refer to *Call Detail Recording: Description and Formats* (553-2631-100).

This section provides a description of the enhancements made to the CDR feature, as applied to an ISDN PRI environment, and related Feature interactions.

Call Detail Recording Enhancement

The Call Detail Recording Enhancement feature is designed to permit billing of different segments of a call to the correct telephone user. CDR calls affected by this feature are outgoing trunk calls that have been transferred one or more times. It also applies to an attendant who originates a CO outgoing call first and then extends it to another party. The users charged are those who originate and control on each transfer while connected to the call. Such detailed CDR billing is facilitated by a CDR “X” record and enhancing the “S” (Start) and “E” (End) records.

The CDR Enhancement feature provides the following improvements:

- Ensures local attendant-originated calls are correctly allocated to the proper chargee

- Generates CDR “X” records for stand-alone multiple call transfers on outgoing non-PPM CO trunks, and
- Generates CDR “X” records for network multiple transfers on outgoing PPM and non-PPM CO trunks. A new CDR field is introduced (BLID – Billing Line Identification) indicating the remote responsible party for the particular call duration specified in the Call Duration field in cases of network multiple call transfers.

Operating parameters

No special hardware is required for CDR X for stand-alone and network non-PPM CO trunk scenarios. For CDR X on network PPM trunks, PPM trunk cards are required.

Feature interactions

Stand-alone PPM Call Transfer

One of the objectives of the Call Detail Recording Enhancement feature is to make sure CDR “S”, “X”, and “E” records do not operate in the same manner as for stand-alone PPM. In an existing stand-alone PPM, an “S” or “X” record is generated at the time that the originating party completes the call transfer and the third party answers.

With the CDR enhancement, in non-PPM stand-alone environments, the “S” and “X” records are generated upon transfer completion time. As soon as the transfer originating party completes the call transfer, regardless of whether the third party answers or not, the CDR “S” or “X” record is printed. A CDR “E” record may be generated against an unanswered DN for its ringing time until the far end trunk disconnects.

Conference/No-hold Conference

The CDR Enhancement only contains improvements to call transfer records. The following table explains the interaction between Conference/No-hold Conference and the CDR Enhancement feature.

CDR Enhancement – Conference Interaction
In the first scenario, A calls an outgoing CO trunk, and conferences B (A, B and the CO trunk are in the same node). The same as the existing non-PPM CDR record. Stand-alone PPM maintains existing operation.

CDR Enhancement – Conference Interaction
In the second scenario, A calls an outgoing CO trunk; A transfers to B; B conferences C; C conferences D; B disconnects; and C disconnects. D transfers to F. All Sets are in the same node. An “S” record is generated against A at transfer time. An “X” record is generated against B when B completes the conference with C. No record is generated when C conferences D. No record is generated when either B or C disconnect. An “X” record is generated against D when D completes the call transfer to F. An “E” record is generated against F when F disconnects. Stand-alone PPM maintains its existing operation.
In the third scenario, A calls an outgoing CO trunk; A transfers to B; B conferences C; C conferences D; B disconnects; and then C disconnects. D transfers to F. Set A and the CO trunk are in Node 1. Sets B, C, D, and F are in Node 2. Nodes 1 and 2 are connected by an ISDN TIE trunk. An “S” record is generated against A at transfer time. No record is generated for B conferencing C or C conferencing D. No record is generated when B disconnects. When C disconnects, an “X” record is generated against B. An “X” is generated against D when D completes the call transfer to F. An “E” record is generated against F when F disconnects.

Override

Whenever a station overrides another station that is established on a CDR trunk call, a Start record is generated for the trunk against the overridden party and a conference is established (however, if there had been a previous Start or “X” record, the override will generate an “X” record). An “E” record is generated against the party disconnecting last (either the overridden or overriding party). However, if the far end disconnects first while the override is in progress, the “E” record is generated against the conference DN.

Barge-in

When an attendant barges-in on a CDR trunk connected to A, a CDR “S” record is generated against A and a conference is established. An “E” record is generated against A when A disconnects. However, if A disconnects before the attendant, an “E” is generated against the attendant when the attendant disconnects to show the barge-in duration and the duration the attendant has spent on the call after A disconnects.

Call Forward

Call Forward All Calls

The following table explains the interaction between Call Forward All Calls and the CDR Enhancement feature.

CDR Enhancement – Call Forward All Calls Interaction
In the first scenario, A calls an outgoing CO trunk, and transfers to B. B call forwards (all calls) to C, and call forwards (all calls) to D. All sets and the CO trunk are in the same node. The same as the existing non-PPM CDR record. Stand-alone PPM maintains existing operation.
In the second scenario, A calls an outgoing CO trunk, and transfer to B. B call forwards (all calls) to C and C call forwards (all calls) to D. A and the CO trunk are in Node 1. B, C, and D are in Node 2. Nodes 1 and 2 are connected by ISDN. An “S” record is generated against A at transfer completion time, regardless of whether or not D answers. When D disconnects, an “E” record is generated against D.
In the third scenario, A calls an outgoing CO trunk, and transfers to B. B call forwards (all calls) to C, and C call forwards (all calls) to D. D transfers to E. A and the CO trunk are in Node 1. B, C, D, and E are in Node 2. Nodes 1 and 2 are connected by ISDN. An “S” record is generated against A at transfer completion time, regardless of whether or not D answers. When D transfers to E, an “X” record is generated against D. When E disconnects, an “E” record is generated against E.

Call Forward No Answer

The following table explains the interaction between Call Forward No Answer and the CDR Enhancement feature.

CDR Enhancement – Call Forward No Answer Interaction
In the first scenario, A calls an outgoing CO trunk, and transfers to B. B call forwards (no answer) to C, and call forwards (no answer) to D. All sets and the CO trunk are in the same node. The same as the existing non-PPM CDR record. Stand-alone PPM maintains existing operation.

CDR Enhancement – Call Forward No Answer Interaction
In the second scenario, A calls an outgoing CO trunk, and unguarded transfers to B. B call forwards (no answer) to C and C call forwards (no answer) to D. A and the CO trunk are in Node 1. B, C, and D are in Node 2. Nodes 1 and 2 are connected by ISDN. An “S” record is generated against A at transfer completion time, regardless of whether or not D answers. When D disconnects, an “E” record is generated against B.
In the third scenario, A calls an outgoing CO trunk, and unguarded transfers to B. B call forwards (no answer) to C, and C call forwards (no answer) to D. D transfers to E. A and the CO trunk are in Node 1. B, C, D, and E are in Node 2. Nodes 1 and 2 are connected by ISDN. An “S” record is generated against A at transfer completion, regardless of whether or not D answers. When D transfers to E, an “X” record is generated against B. When E disconnects, an “E” record is generated against E.
In the fourth scenario, A calls an outgoing CO trunk, and guarded transfers to B. B call forwards (no answer) to C, and C call forwards (no answer) to D. D answers and A completes the transfer. D disconnects. A and the CO trunk are in Node 1. B, C, and D are in Node 2. Nodes 1 and 2 are connected by ISDN. An “S” record is generated against A at transfer completion time. When D disconnects, an “E” record is generated against D.

Call Forward Busy

See Call Forward All Calls.

Internal Call Detail Record (ICDR)

The CDR Enhancement generates a CDR “X” record at the completion of call transfer, when an outgoing CO trunk is involved in the call. There are no changes to the ICDR feature. The two features are independent.

Call Waiting

In a call transfer on a busy station A with Call Waiting Allowed, a CDR “S” or CDR “X” record is generated when the transferring station disconnects. An “E” record is generated when either A or the far end/trunk disconnects, and the duration includes the waiting time.

Initialize

If the system initializes, the CDR information is lost.

Attendant Recall

The following table explains the interaction between Attendant Recall and the CDR Enhancement feature.

CDR Enhancement – Attendant Recall Interactions
In the first scenario, the attendant calls an outgoing CO trunk, and extends the call to A. A presses the Attendant Recall (ARC) key to recall the attendant and a three-party conference is established (the trunk is not a CDR X trunk). An “S” record is generated against the attendant when the attendant presses the Release key. An “E” record is generated at the end of the call against the party who disconnects last. Stand-alone PPM maintains existing operation.
In the second scenario, the attendant makes an outgoing CO call, and extends the call to A. A presses the Attendant Recall (ARC) key to recall the attendant and a three-party conference is established (the trunk is a CDR X trunk). An “S” record is generated against the attendant when the attendant presses the Release key. An “X” record is generated against A when the attendant presses the LOOP key to respond to the call. If A disconnects first, then the attendant releases, an “E” record is generated against the attendant. If the attendant releases first, an “X” record is generated against the attendant. An “E” record is generated against A when A disconnects.
In this third scenario, the attendant makes an outgoing CO call, and extends the call to A. A presses the Attendant Recall (ARC) key twice which is also treated as a transfer complete (the CO trunk is a CDR X trunk). An “S” record is generated against the attendant when the attendant presses the Release key. An “X” record is generated against A when A presses the ARC key twice to complete the transfer. An “E” record is generated against the attendant when the attendant releases.

Meridian Mail

Stand-alone Non-PPM

During call transfer, if the outgoing CDR X trunk terminates at Meridian Mail because of call redirection, the CDR “E” record is generated against the Meridian Mail virtual agent DN when the far end disconnects.

If an outgoing CDR X trunk is transferred to Meridian Mail, and the far end caller uses “through dial” to call the attendant, an “X” record is generated against the Meridian Mail virtual agent DN. If the attendant extends the call to A, an “X” record is generated against the attendant. When A disconnects, an “E” record is generated against A.

Network PPM and Non-PPM

During network call transfer, if the outgoing CDR X trunk is transferred through ISDN directly to Meridian Mail, the CDR record is generated against the Meridian Mail virtual agent DN.

During network call transfer, if the outgoing CDR X trunk is transferred though ISDN to a remote DN which is Call Forwarded (All Calls) to Meridian Mail, the CDR record is generated against the Meridian Mail virtual agent DN.

During network call transfer, if the outgoing CDR X trunk is unguarded transferred through ISDN to a remote DN that is Call Forward (No Answer) to Meridian Mail, the CDR record is generated against the remote DN instead of the Meridian Mail virtual agent DN.

During network call transfer, if the outgoing CDR X trunk is guarded transferred through ISDN to a remote DN which is Call Forwarded (No Answer) to Meridian Mail, the CDR record is generated against the Meridian Mail virtual agent DN.

Hunting

See Call Forward All Calls.

Call Park

The following table explains the interaction between Call Park and the CDR Enhancement feature.

CDR Enhancement – Call Park Interaction
In the first scenario, A calls an outgoing CO trunk, and presses the Call Park key twice. Later, the CO recalls back to A. A disconnects. The same as for the existing non-PPM CDR.
In the second scenario, A calls an outgoing CO, and transfers to B. B presses the Call Park key twice. The CO recalls back to B. B disconnects. An “S” record is generated against A at transfer completion time. When B presses the Call Park key twice, an “X” record is generated against B. The CO later recalls back to B. An “E” record is generated against B when either B or the trunk disconnects.

CDR Enhancement – Call Park Interaction
In the third scenario, A calls an outgoing CO trunk, and presses the Call Park key twice. B dials Special Service Prefix (SPRE) + Parked Call Access code (72) + the identification number assigned to the parked call to access the parked call later. B transfers to C. C disconnects. An “S” record is generated against A when A presses the Call Park key twice. An “X” record is generated against B at transfer completion time, regardless of whether or not C answers. An “E” record is generated against C when either C or the CO trunk disconnects.

Call Pickup

The following table explains the interaction between Call Pickup and the CDR Enhancement feature.

CDR Enhancement – Call Pickup Interaction
In the first scenario, A makes an outgoing CO call, and transfers to B. B unguarded transfers to C and C does not answer. D picks up the call by pressing the DN key and the RNP key. All sets are in the same node. An “S” record is generated against A at transfer completion time. An “X” record is generated against B at transfer completion time. An “E” record is generated against C when D picks up the call. An “N” record is generated against D when either D or the far end disconnects. If D does not disconnect, and instead transfers to F, an “S” record is generated against D at transfer completion time, and an “E” record is generated against F when F or the far end disconnects.
In the second scenario, A makes an outgoing CO call, and transfers to B. B transfers to C and C does not answer. D picks up the call by pressing the DN key and the RNP key. A and the CO are in Node 1. B, C, and D are in Node 2. Nodes 1 and 2 are connected by ISDN. An “S” record is generated against A at transfer completion time. An “X” record is generated against B at transfer completion time. An “E” record is generated against C when D disconnects.
In the final scenario, A makes an outgoing CO call, and transfers to B. B guarded transfers to C and C does not answer. D picks up the call by pressing the DN key and the RNP key. All sets are in the same node. An “S” record is generated against A at transfer completion time. An “X” record is generated against B at transfer completion time and D picks up the call. An “E” record is generated against D when D or the far end disconnects. If D does not disconnect, and instead transfers to F, an “X” record is generated against D at transfer completion time, and an “E” record is generated against F when F or the far end disconnects.

Automatic Call Distribution

For ACD Call Transfer, ACD Conference and Network ACD, CDR records are generated as if these feature are functioning in a non-ACD environment. For the Agent Observe subfeature, CDR records are generated as for a conference on non-ACD calls.

Disconnect Supervision

The Central Office can notify the Meridian 1 trunk card that the office has released when the trunk has disconnect supervision. The control of the trunk disconnect can be made by the far end or by the near end. The CDR records are generated when the trunk disconnects.

Network Attendant Service

When a remote attendant at Node 1 is involved in an outgoing CDR X trunk at Node 2 through the ISDN network, the CDR at Node 2 treats it as if it were a call transfer. There are three cases for Network Attendant Service as follows: 1, the set calls the attendant and the attendant extends out; 2, the attendant calls out and extends to a local set; 3, the attendant calls the set first, then extends out.

In the first case, an “S” record is generated against the remote attendant DN (e.g., 0000 or 0), and an “E” record is generated against the set when the set disconnects. In the second case, an “S” record is generated against the remote attendant DN, and another “E” record is generated against the set when the set disconnects. In the third case, an “S record is generated against the remote attendant DN, and another “E” record is generated against the set when the set disconnects.

Break-in

The following table explains the interaction between Break-in and the CDR Enhancement feature.

CDR Enhancement – Break-in Interaction
In this scenario, A makes an outgoing CO call, and then transfers to B. B is talking to the outgoing CO. C calls the attendant, and the attendant Breaks-in to B. B disconnects. An “S” record is generated against A at transfer completion time. An “X” record is generated against B when the attendant Breaks-in. An “E” record is generated against the conference DN when B disconnects.

Break-in to Enquiry Calls

The following table explains the interaction between Break-in to Enquiry Calls and the CDR Enhancement feature.

CDR Enhancement – Break-in to Enquiry Calls Interaction
In this scenario, A makes an outgoing CO call, and transfers to B. B transfers to C, and is talking to C without completing the transfer. D calls the attendant, and the attendant Breaks-in to B. B disconnects. C is connected to the outgoing CO. An “S” record is generated against A at transfer completion time. An “X” record is generated against B when B disconnects. An “E” record is generated against C when C disconnects.

Attendant Metering Recall

This feature does not support Attendant Metering Recall.

Virtual Network Service

If “Trunk on hold for reuse” is not configured, the COT trunk is released when the VNS call is released. If the COT trunk is a PPM trunk, the different sets involved in the call will be charged as for a regular non-VNS call. CDR “N”, “S”, “X”, and “E” records will be generated according to the call modifications. CDR X/PPM operation should be transparent to the VNS feature.

If “Trunk on hold for reuse” is configured, the COT trunk is kept established after the VNS call is released and a CDR “S” record is produced with no charge information in it. If a new VNS call uses the same trunk, a CDR “X” record is printed, once again containing no charge information.

Multi-party Operations

"Recovery of Misoperation on Call Transfer" interacts with the CDR Enhancement feature. The following table explains the interaction between this feature and the CDR Enhancement feature.

CDR Enhancement – Multi-party Operations Interaction
In this scenario, A calls an outgoing CO and transfers to B. B transfers to C and C does not answer. After a pre-defined number of rings, the call is recalled back to B. If B does not answer after a pre-defined number of rings, the call is dropped. All sets are 500 sets. An "S" record is generated against A at transfer completion time. An "X" record is generated against B at transfer completion time. An "E" record is generated against C when C does not answer after a pre-defined number of rings and the call is recalled back to B. An "N" record is generated against "B" when the call is dropped.

Busy Verification

The following table explains the interaction between Busy Verification and the CDR Enhancement feature.

CDR Enhancement – Busy Verification Interaction
In this example, A calls an outgoing CO trunk, and transfers to B. B is talking to the outgoing CO. The attendant performs a Busy Verification on B. An "S" record is generated against A at transfer completion time. An "X" record is generated against B when the attendant presses the Busy Verify key and dials B's DN. An "E" record is generated against B, if the attendant disconnects before B. An "E" record is generated against the conference DN if B disconnects before the attendant. An "E" record is generated against the conference DN if the far end trunk disconnects first.

Feature packaging

For stand-alone and network non-PPM environments, the following software package is required:

- Call Detail Recording Enhancement (CDRX) package 259, which is dependent on:
  - — Call Detail Recording (CDR) package 4;
  - — Call Detail Recording Teletype Terminal (CTY) package 5; and
  - — New Format Call Detail Recording (FCDR) package 234.

CDR for the attendant is included as part of Call Detail Recording (CDR) package 4 and is applicable to outgoing trunks.

Network PPM CDRX is included as part of Periodic Pulse Metering/Message Registration (MR) package 101.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 17 – Change the Configuration Record for CDR Enhancement.

2 LD 16 – Configure the route data block to print CDR "X" records.

3 LD 15 – Configure the Customer Data Block for CDR Enhancement.

LD 17 – Change the Configuration Record for CDR Enhancement.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	PARM	Change system parameters.
...		
- FCDR	NEW	Format for Call Detail Recording.
- MTRO	PPM	Periodic Pulse Metering

LD 16 – Configure the route data block to print CDR "X" records.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	RDB	Route data block.
CUST	xx	Customer number.
ROUT	xxx	Route number.
...		

TKTP	COT DID WAT FEX	Central Office Trunk data block. Direct Inward Dialing trunk data block. Wide Area Telephone Service trunk data block. Foreign Exchange trunk data block.
CDR	YES	CDR provided.
- INC	(NO) YES	CDR records generated for incoming calls.
- OAL	YES	CDR records generated for outgoing calls.
- - OTL	(NO) YES	CDR on Outgoing Toll calls.
- - OPD	(NO) YES	Outpulsed digits recorded in CDR.
- CDRX	(NO) YES	Print CDR X records on multiple call transfer for non-PPM outgoing calls. This prompt appears if the CDRX package 259 is equipped, and “MR” is not “PPM”, “XLD” “ENDC”, “DURC”, or “IFC” is not equal to 1TR6.

LD 15 – Configure the Customer Data Block for CDR Enhancement.

Prompt	Response	Description
REQ:	CHG	Change.
TYPE:	CDR	CDR and Charge Account options.
CUST	xx	Customer number
...		
CDR	YES	Call Detail Recording

Feature operation

No specific operating procedures are required to use this feature.

Call Forward All Calls/No Answer

Contents

The following are the topics in this section:

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Feature operation 414

Feature description

Call Forward All Calls and Call Forward No Answer enable callers to manually forward or forward on a no answer to any other station on the ISDN network. The receiving location is provided with the dialed number, the calling number, and if CPND is optioned, the caller’s name plus the reason for the redirection. The caller's display is also updated to show the name and number of the person the call was redirected to plus the reason for the redirection.

This feature is applicable to the following telephones for Name and Number display:

- M2250 Attendant Console
- Meridian Telephones equipped with digit display:
  - M3000 Touchphone
  - M2317

— M2008

— M2616

— M2216

Operating parameters

There are no operating parameters associated with this feature.

Feature interactions

There are no feature interactions associated with this feature.

Feature packaging

This feature requires the following packages:

- Digit Display (DDSP) package 19;
- Integrated Services Digital Network (ISDN) package 145;
- International Primary Rate Access (PRI) package 146; or
- ISDN signaling Link (ISL) package 147;
- Calling Party Name Display (CPND) package 95.

Feature implementation

There are no specific implementation procedures for this feature.

Feature operation

No specific operating procedures are required to use this feature.

Call Forward, Break-In and Hunt Internal or External Network Wide

Contents

The following are the topics in this section:

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Feature operation 420

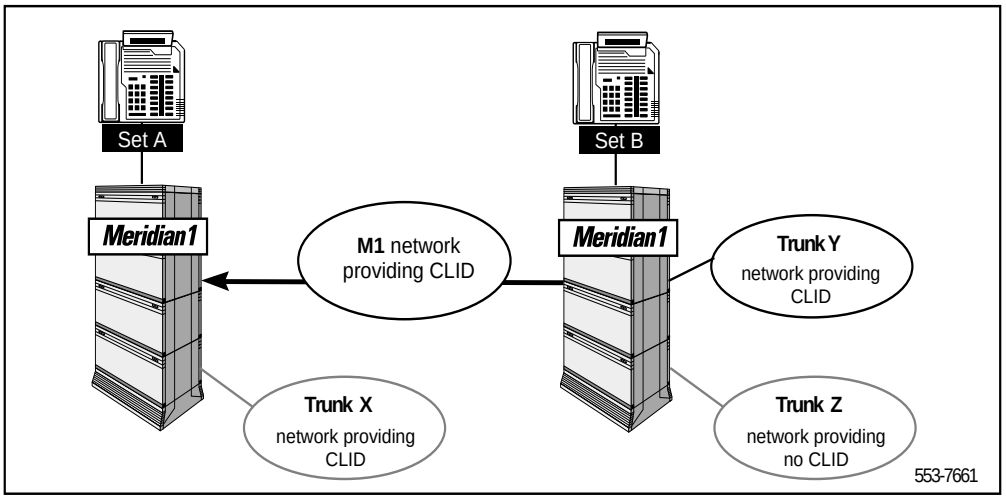
Feature description

The Call Forward, Break-In and Hunt Internal or External Network Wide feature determines whether a call is treated as internal or external on a network wide basis. A call is treated as internal if it terminates and originates within a private network. A call is treated as external if it terminates or originates outside a private network. These definitions of internal/external call are applied to incoming calls for the Call Forward by Call Type feature and to outgoing calls for the Break-In feature.

A network-wide call receives internal treatment if the Numbering Plan Identifier (NPI) in the Calling Line Identification (CLID) is private. Conversely, if the NPI is not present, the Network Attendant Services (NAS) information will be used if it is configured.

If neither the CLID, NAS, QSIG or DPNSS information is present, the following occurs. The route class mark defined in the route data block will be used to collect information necessary to determine whether a call should be given internal or external treatment. The network wide definition can be superseded by the route class. This can be configured on a route basis by entering local data at the "LOC" for internal treatment the at the new prompt "IDEF" prompt in the customer data block configuration (LD 15).

Figure 46
Example of Calling Line Identification for Incoming Calls



An incoming call is always treated as internal provided the originating party is not a trunk. However, if the originating party is a trunk, Calling Line Identification is present and NPI is private the call is treated as internal.

Figure 46 illustrates several examples of incoming call treatments. When Set B dials Set A and receives no answer the Call Forward by Call Type features is activated from Set A's node. This type of call is treated as an internal call because the Number Plan Identification (NPI) is private in the Calling Line Identification (CLID).

When Trunk Y calls Set A and Set A does not answer, the Call Forward by Call Type feature is activated from Set A's node. The calling CLID initially received is NPI public or unknown. This is transported to Set A's node and the call receives internal treatment.

When Trunk X calls Set A and Set A does not answer, the Call Forward by Call Type feature is activated at from Set A's node. The calling CLID initially received is NPI public or unknown. The call receives external treatment.

With a private network inter-exchange signaling protocol QSIG, the CLID and NPI are used if they are present. If this information is not present, then the QSIG specific data giving information on the far end of the call is used. Since no NPI is provided by the DPNSS protocol, the Calling Line Category is used.

Operating parameters

The only features impacted by this feature are Call Forward/Hunt by Call Type, Internal Call Forward and Attendant Break-In. The Attendant Break-In feature will continue to treat conference calls as external. Network side conference is not considered.

This feature operates using the available information that is associated with a call. This information is decoded to determine different treatments for Break-In Indication, Call Forward/Hunt by Call Type or Internal Call Forward.

For outgoing calls, this feature functions by the information created from the terminating node back to the originating node.

QSIG calls are treated depending on the equivalent information to the NPI or to NAS type information transported.

Digital Private Network Signaling System #1 (DPNSS) does not support NPI. Alternatively, DPNSS supports NAS type information when connected to an attendant on the originator and the route (called Calling Line Category). This information will be considered when available. With Digital Access Signaling System #2 (DASS), Calling Line Category is not supported and calls will always be treated as external.

Internal Call Forward considers the transferred party and not the transferring party (both attendant and set) when the transferring party is on the treating node. Information transported across the network by NAS, DPNSS or QSIG from a network side transferred call is not considered. The information on the transferring party only will determine the type of treatment given to a call.

Feature interactions

Attendant Break-In
Attendant Break-In Indication and Prevention
Call Forward by Call Type

If the Internal/External definition in LD 15 is set to YES, a call is treated as internal or external on a network wide basis.

Call Forward, Internal

If a treated call is a transfer call and the transferring call is on the treating node, the transferred party will be considered. However, when the transferring party is not on the treating node, the transferring party will determine the treatment given.

Call Transfer
Network Call Transfer
Network Call Redirection

The treatment of a call following a call transfer (Call Forward/Hunt by Call Type) is based on the transferring set and the call originator's set. The set display on network call modification or redirection does not change.

Network Attendant Service

When a call is transferred, a new facility message is sent to the transferred party's node to transport the terminal indicator parameter or the access trunk information parameter.

DPNSS1
QSIG

Call Forward, Break-In and Hunt Internal or External Network Wide uses the NAS equivalent information that is transported on protocols such as Party Category and Progress Indicator for QSIG and Calling Line Category for Digital Private Network Signaling System No. 1 (DPNSS).

Feature packaging

Depending on the capabilities of this feature, the following packages are required:

- Call Forward, Break-In and Hunt Internal or External Network Wide is included in base X11 system software;
- NAS messaging requires Network Attendant Services (NAS) package 159;
- DPNSS requires Integrated Digital Access (IDA) package 122 and Digital Private Network Signaling System No. 1 (DPNSS) package 123; and 2Mbit Primary Rate Interface (PRI2) package 154;
- QSIG requires (QSIG) package 263.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 15 – Define Network Wide definition of Internal/External Calls in Customer Data Block.

2 LD 16 – Modify Route Data Block to Define Internal/External Calls.

LD 15 – Define Network Wide definition of Internal/External Calls in Customer Data Block.

Prompt	Response	Description
REQ:	CHG	Change.
TYPE:	FTR	Customer Features and options.
CUST	xx	Customer number.
- IDEF	YES	Network-wide internal or external definition for Call Forward/Hunt by Call Type, Internal Call Forward and Break-In Indication Prevention. Calls will be treated as internal or external according to the network-wide definition. NO = call will be treated as internal or external as it was previously programmed.

LD 16 – Modify Route Data Block to Define Internal/External Calls.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	RDB	Route data block.
CUST	xx	Customer number.
ROUT	xx	Route number.
...		
RCLS	(EXT) INT	Route Class marked as External or Internal.
IDEF	(NET) LOC	Internal/External Definition. If NET is entered, any call over the selected route will receive network treatment according to available network information. If LOC is entered, the route class of the selected route will supercede any other information. A call over this route will receive internal treatment if the route class is set to internal, otherwise it will receive external.
Note: The prompt IDEF will output only if IDEF = YES in the Customer Data Block. If IDEF = NO, any information that was entered previously at the IDEF prompt will not influence the treatment received by a call.		

Feature operation

No specific operating procedures are required to use this feature.

Call Forward/Hunt Override Via Flexible Feature Code

Contents

The following are the topics in this section:

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Feature description

Call Forward/Hunt Override Via FFC allows telephone users (with a specific Class of Service) and attendants, to override Intercept Computer Call Forward (ICP-CFW), Call Forward All Calls, Call Forward No Answer, Hunting and Make Set Busy by entering a Flexible Feature Code. In order to use this feature, the originating set must have Call Forward Hunt Allowed (CFHA) Class of Service.

When this feature is enabled if override is attempted, and the called party is idle, the set is rung regardless of any diversion. If the dialed set is busy and has Hunt active, the calling party will terminate on the wanted set and receive a busy indication. Sets without Call Forward/Hunt Override denied (CFHD) Class of Service will not be able to use the Call Forward/Hunt Override Via Flexible Feature Code (FFC) feature.

Call Forward/Hunt Override Via FFC works in network environments with Meridian 1 nodes and Meridian Customer Defined Network (MCDN) links.

Operating parameters

The Call Forward/Hunt Override FFC can only be used in predial mode from a set (i.e., it has to be dialed before dialing the DN that has Call Forward All Calls, Intercept Call Forward, Call Forward No Answer, Hunt, or Make Set Busy active).

The Call Forward/Hunt Override FFC can only be dialed from its own node (i.e., it has to be dialed before any trunk access code).

The Call Forward/Hunt Override FFC is normally not allowed to be defined as a Flexible DN, External Flexible DN, Hunt DN, or External Hunt DN.

On an ABCD set the Call Forward/Hunt Override FFC can only be configured as a predial FFC. (ABCD sets are a type of German telephone.)

Call Forward/Hunt Override FFC can only be used against extensions with one of the following type: HOT/MCN/MCR/SCN/SCR/BRI DNs and PBX sets.

It is not possible for BRI extensions to dial a Call/Forward Hunt Override FFC.

The Call Forward/Hunt Override via FFC feature can only be used in stand-alone and MCDN environments. If no MCDN links are involved, no information about Call Forward/Hunt Override will be passed on to other nodes.

To get the functionality of Call Forward/Hunt Override Via FFC in an MCDN environment these enhancements must be integrated in the originating node, terminating node and any intermediate nodes.

Feature interactions

Attendant Blocking of DN

Using Call Forward/Hunt Override FFC after activation of ABDN is not allowed. Any attempt will be canceled and overflow tone will be returned.

ACD

ACD DNs are not overridden by Call Forward/Hunt Override Via FFC. Any attempt will be canceled and access denied treatment will be returned. Individual DNs on an ACD set are overridden by Call Forward/Hunt Override Via FFC with the same limitations as for other sets.

Boss Secretary Filtering/Call Forward All Calls /Call Forward No Answer/Call Forward and Busy Status/Internal Call Forward/Make Set Busy

These features are overridden by the Call Forward/Hunt Override Via FFC feature, but there are no changes to the features themselves.

BRI

BRI sets are not supported; any attempt to dial Call Forward/Hunt Override from a BRI set will be ignored and access denied treatment will be returned.

BRIT

BRI TIE trunks in a Meridian Customer Defined Network (MCDN) are supported.

Barge-in/Busy Verify /Break-in

Using Call Forward/Hunt Override Via FFC after activation of Barge-in, Busy Verify or Break-in is not allowed. Attempts will be canceled and overflow tone will be returned.

Using post-dial Break-in after dialing the Call Forward/Hunt Override FFC is possible after encountering a busy set, if Break-in is enabled.

Call Redirection by Time of Day

Call Forward/Hunt Override Via Flexible Feature Code takes precedence over Call Redirection by Time of Day (CRTOD).

Call Transfer

A set can activate Call Forward/Hunt Override Via FFC when initiating a transfer. If the transfer is completed while ringing, the Call Forward/Hunt Override will still be active and passed on to the transferred party.

Call Waiting

Call Waiting can be used even if the Call Forward/Hunt Override Via FFC feature has been activated. When a busy set with Call Waiting configured is encountered, it will terminate on Call Waiting.

Call Waiting Redirection

There is no interaction with the Call Waiting treatment component of the Call Waiting Redirection feature. However, Call Forward/Hunt Override via Flexible Feature Code does override CFNA, and thus the CFNA treatment given to unanswered Call Waiting calls by the Call Waiting Redirection feature is overridden by the CFHO feature. The incoming call will continue to be given Call Waiting treatment as if the Call Waiting Redirection feature is disabled when the CFHO feature is enabled by the calling party.

Camp-on

When a busy set is encountered, it is possible to Camp-on to the set, even if Call Forward/Hunt Override Via FFC has been activated.

DISA

DISA is not supported. Any attempt to dial the Call Forward/Hunt Override FFC will be ignored and access denied treatment will be returned.

DPNSS1

DPNSS1 is only supported as an incoming trunk transferred to a MCDN environment using Call Forward/Hunt Override Via FFC.

Do Not Disturb (DND)

This feature is not overridden by the Call Forward/Hunt Override Via FFC feature. Trying to override DND results in DND treatment.

Phantom DN

This feature is not overridden by the Call Forward/Hunt Override Via FFC feature. If Call Forward/Hunt Override Via FFC is used against a phantom TN the call will be canceled and overflow tone will be given.

Flexible DN (FDN), External Flexible DN (EFD)

It is not possible to store the Call Forward/Hunt Override FFC as an FDN or EFD.

Group Call

It is not possible to use the Call Forward/Hunt Override FFC as a Group Call DN.

Group Hunt

Primary Line Directory Numbers (PLDNs) are not overridden by the Call Forward/Hunt Override Via FFC feature. Any attempt will be ignored and access denied treatment will result.

Hunt

This feature is overridden by the Call Forward/Hunt Override Via FFC feature. If a set activating Call Forward/Hunt Override Via FFC encounters a busy set no hunt steps will be performed; the call will terminate on the DN and busy tone will be returned.

Hunt DN/External Hunt (EHT) DN

It is not possible to store the Call Forward/Hunt Override FFC as a Hunt or EHT DN.

Last Number Redial

The Call Forward/Hunt Override FFC and the dialed DN are stored under Last Number Redial.

Intercept Computer (ICP) Call Forward

This feature is overridden by the Call Forward/Hunt Override Via FFC feature. The Call Forward/Hunt Override FFC replaces the old ICP Override FFC. To get the functionality of ICP override, the ACD agent ICP position must have the new CLS CFHA.

Idle Extension Notification (IEN)

This feature can be used even if the Call Forward/Hunt Override Via FFC feature is activated. When a busy set is encountered, it is possible to place an IEN request against the set.

Multiple Appearance Multiple Call Arrangements (MCAs)/Multiple Appearance Single Call Arrangements (SCAs)

If the Call Forward/Hunt Override FFC is used against an MCA (MCR/MCN) or SCA (SCR/SCN) DN it will override any active forward and terminate on all idle appearances. If all appearances are busy, busy treatment will be returned.

Primary Line Directory Number (PLDN)

It is not possible to store the Call Forward/Hunt Override FFC as a PLDN.

Phantom TN

This feature is not overridden by the Call Forward/Hunt Override FFC. If a Call Forward/Hunt Override FFC is used against a Phantom TN, the call will be canceled and overflow will be given.

Priority Override

Using the feature Priority Override is possible after using the Call Forward/Hunt Override FFC and encountering a busy set.

Radio Paging

If Radio Paging is activated in a call where Call Forward/Hunt Override has been used, the Call Forward/Hunt Override feature will be deactivated.

Ring Again/Network Ring Again

Using the Ring Again feature is possible after using the Call Forward/Hunt Override FFC and encountering a busy signal. Ring Again can be placed against the set for which the Call Forward/Hunt Override FFC was used (i.e., the set with CFW active should be rung by the Ring Again feature).

Ring Again No Answer/Network Ring Again No Answer

Using the Ring Again No Answer feature is possible after using the Call Forward/Hunt Override FFC and encountering an idle set that does not answer. Ring Again No Answer can be placed against the set for which the Call Forward/Hunt Override FFC was used (i.e., the set should be rung by the Ring Again No Answer feature).

Single Digit Access (SDA)

It is not possible to store Call Forward/Hunt Override FFCs in an SDA list.

Semi-automatic Camp-on (SACP)

This feature can be used even if the Call Forward/Hunt Override Via FFC feature is activated. When encountering a busy set, it is possible to activate SACP, if it is applicable.

Speed Call

The Call Forward/Hunt Override FFC can be stored in a speed call list.

Feature packaging

For stand-alone environments, the following package is required:

- Flexible Feature Codes (FFC) software package 139.

For network environments, the following software package must also be provided:

- Network Attendant Service (NAS) package 159.

Attendant Overflow Position (AOP) package 56 must be restricted, as it is mutually exclusive with Network Attendant Service.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 57 – Define FFC for Call Forward/Hunt Override.

2 LD 10 – Set Class of Service for the Forward/Hunt Override Via FFC.

3 LD 11 – Set Class of Service for the Forward/Hunt Override Via FFC for Meridian 1 propriety sets.

4 LD 18 – Configure ABCD key for the Forward/Hunt Override Via FFC.

LD 57 – Define FFC for Call Forward/Hunt Override.

Prompt	Response	Description
REQ	NEW CHG	New, or change.
TYPE	FFC	Flexible Feature Code.
...		
CODE	CFHO	Call Forward/Hunt Override Via FFC.
CFHO	nnnn	Call Forward/Hunt FFC.
...		

LD 10 – Set Class of Service for the Forward/Hunt Override Via FFC.

Prompt	Response	Description
REQ:	NEW, CHG	New, or change.
TYPE:	500	Type of telephone set.
...		
CLS	(CFHD) CFHA	Call Forward/Hunt Override Via FFC is (denied) or allowed.
...		

LD 11 – Set Class of Service for the Forward/Hunt Override Via FFC for Meridian 1 propriety sets.

Prompt	Response	Description
REQ:	NEW CHG	New, or change.
TYPE:	xxxx	Type of telephone set.
...		
CLS	(CFHD) CFHA	Call Forward/Hunt Override Via FFC is (denied) or allowed.
...		

LD 18 – Configure ABCD key for the Forward/Hunt Override Via FFC.

Prompt	Response	Description
REQ	NEW CHG	New, or change.
TYPE	ABCD	Modifying 16-button DTMF.
...		
PRED	YES	Function table for pre-dial.
A	CFHO*FFC*	CFHO is assigned to key A.

B	CFHO*FFC*	CFHO is assigned to key B.
C	CFHO*FFC*	CFHO is assigned to key C.
D	CFHO*FFC*	CFHO is assigned to key D.

Feature operation

There are no operating procedures specified for this feature.

The user gets the same functionality in a Meridian Customer Defined Network (MCDN) as in standalone environments. The Call Forward/Hunt Override information is transmitted from the originating node to the terminating node using the Network Attendant Service (NAS) feature.

Activation of the service is call dependent; network-wide Call Forward/Hunt Override is part of the NAS feature.

To activate the Call Forward/Hunt Override feature, the user dials the FFC for Call Forward/Hunt Override and the DN of the wanted party. If the set is idle, the set is rung regardless of any diversion (e.g., Call Forward All Calls, Intercept Call Forward, Call Forward No Answer, or Hunt) or Make Set Busy on the set.

If the set(s) have displays, the display(s) are updated. If the display on the originating set is updated when the call is answered, the Call Forward/Hunt Override FFC will no longer be displayed.

If the dialed set is busy and Hunt is active, the calling party will terminate on the wanted set and will receive busy indication.

If the dialed set is idle, but does not answer within the defined number of ringing cycles for CFNA, the call is not forwarded (i.e., it continues to ring).

If the dialed set is busy, the attendant can activate Camp-on, if Camp-on is applicable. In addition, Ring Again can be placed against a set for which Call Forward/Hunt Override was used and a busy set was encountered.

Call Page Network Wide

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Feature description

The Call Page Network Wide (PAGENET) feature expands call paging capabilities by allowing an attendant or user to access a paging trunk route located on a different node.

The PAGENET feature controls external paging access privileges with the following levels of access: Restricted, Controlled and Uncontrolled. On the paging trunk, trunks are assigned a level of access on a trunk route basis. On other network nodes, access privileges can be assigned to attendant consoles and sets.

If the paging trunk route at the paging node is configured as PAGENET Restricted, all external users are prevented from accessing the paging trunk route. Access attempts from an external location are given a defined intercept treatment by the paging node.

PAGENET Controlled allows limited access to external users meeting the following criteria:

- the Attendant Console or set is programmed with PAGENET allowed in the Class of Service;
- the point-to-point D-channel is configured with remote capability (e.g RCAP=NAC).

With PAGENET Uncontrolled, all external users can access the paging route provided that the call paging request to the paging node is incoming via a TIE or a VNS Bearer trunk.

When the call paging request has been accepted and established by the paging node, the originator does not receive any special indication when the call is connected to the paging trunk.

Operating parameters

A user may experience a delay between the time of dialing the last digit and the actual call termination. The Call Page Network Wide feature does not change this operation. Therefore, with external paging calls the user may not realize when a connection is actually established unless the paging equipment provides audible notification.

External PAGENET uncontrolled calls are supported on Integrated Services Digital Network (ISDN) and non-ISDN networks provided that the incoming trunk into the Paging node is a TIE Trunk.

External PAGENET Controlled is only supported on Virtual Network Services (VNS) and ISDN networks, provided that the caller is using an Attendant Console or PAGENET allowed set and the point-to-point D-channel connection between the nodes has remote capability of network access (e.g. RCAP = NAC).

Feature interactions

Attendant Barge-In
Attendant Break-In

For external PAGENET uncontrolled calls, Attendant Barge-In is blocked at the Paging node, per existing operation.
For external PAGENET controlled calls, Attendant Barge In is blocked at both the originating and Paging node.

Attendant Call Extension

If an attendant's source (SRC) or destination (DEST) Key is connected to an external PAGENET uncontrolled trunk, Attendant Call Extension is not blocked. However, if an attendant's SRC or DEST Key is connected to an external PAGENET controlled route, Attendant Call Extension is blocked.

Call Forward All Calls
Call Forward No Answer
Hunt

PAGENET does not block a station set from being programmed to Call Forward All Calls, Call Forward No Answer or Hunt to an external Paging trunk. At call termination time, calls that are forwarded to an external PAGENET uncontrolled trunk are not blocked. However, calls forwarded to an external PAGENET controlled trunk are given access denied intercept treatment at the Paging node.

Call Park
Call Transfer
Conference
No Hold Conference

A station set or Attendant Console that parks, transfers or conferences an external PAGENET uncontrolled call is not blocked. However, an external PAGENET controlled call is blocked.

Originator Routing Control/Remote Virtual Queuing

This is supported for an incoming call to a Paging trunk when all the trunk members of the dialed Paging route are busy.

Feature packaging

Call Page Network Wide (PAGENET) requires package 307.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 16 – Configuring Paging Route.

2 LD 16 – Configuring BRI Trunk Route.

3 LD 14 – Paging Trunk Configuration.

4 LD 10 – Assign Class of Service to Analog (500/2500 type) telephones.

5 LD 11 – Assign Class of Service to Meridian 1 Proprietary Telephones.

6 LD 27 – Assign Class of Service to ISDN BRI sets.

7 LD 17 – D-channel Message Configuration.

LD 16 – Configuring Paging Route.

Prompt	Response	Description
REQ	NEW	New.
TYPE	RDB	Route data block.
CUST	xx	Customer Number associated with route.
...		
TKTP	PAG	Paging Route.
NACC	(PGNR) PGNC PGNU	Call Page Network Wide Restricted (default). Call Page Network Wide controlled (ISDN only) Call Page Network Wide uncontrolled (PGNU is equivalent to ISDN/Analog media.)
ICOG	OGT	Outgoing trunk.
TARG	1-15	Trunk Access Restriction Group.

LD 16 – Configuring BRI Trunk Route.

Prompt	Response	Description
REQ	NEW	New.
TYPE	RDB	Route data block.
CUST	xx	Customer number.
...		
DTRK	YES	Digital Trunk route.

DGTP	BRI	Digital Trunk type.
RCAP	NAC	Remote capability where: NAC = Class of Service data. XNAC = removes Class of Service as a remote capability (default).

LD 14 – Paging Trunk Configuration.

Prompt	Response	Description
REQ	NEW	New.
TYPE	PAG	Trunk type.
TN	l s c u	Terminal number.
	c u	For Option 11C.
RTMB	0-511 1-510 0-127 1-510	Route number and member number, for Options 51C-81C. Route number and member number, for Option 11C.

LD 10 – Assign Class of Service to Analog (500/2500 type) telephones.

Prompt	Response	Description
REQ:	NEW CHG	New, or change.
TYPE:	500	Type telephone.
...		
CLS	PGNA	Call Page Network Wide Allowed. (PGND) = Call Page Network Wide Denied (default).

LD 11 – Assign Class of Service to Meridian 1 Proprietary Telephones.

Prompt	Response	Description
REQ:	NEW CHG	New, or change.

TYPE:	xxxx	Telephone type, where xxxx = SL1, 2006, 2008, 2009, 2016, 2018, 2112, 2216, 2317, 2616, or 3000.
...		
CLS	PGNA	Call Page Network Wide Allowed. (PGND) = Call Page Network Wide Denied (default).

LD 27 – Assign Class of Service to ISDN BRI sets.

Prompt	Response	Description
REQ	NEW CHG	New, or change.
TYPE	DSL	Type of data block.
DSL	l s c dsl c dsl	Digital Subscriber Loop address. For Option 11C.
CLS	PGNA	Call Page Network Wide Allowed. (PGND) = Call Page Network Wide Denied (default).

LD 17 – D-channel Message Configuration.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	ADAN	Input or Output Devices.
ADAN	CHG DCH x	Change D-channel. x = 0-63.
- CTYP	DCHI	D-channel interface card. For Option 11C, enter MSDL for Multi-purpose Serial Data Link.
RCAP	NAC	Remote capability where: NAC = Class of Service data. XNAC = removes Class of Service as a remote capability (default).

Feature operation

Internal Paging Call

No specific operating procedures are required to use this feature.

External Paging Call

When a user makes an external Paging call via dial access, one of the following dialing plans must be used:

1 Route Access Code (ACOD) that connects user to Paging node and Paging route ACOD;

2 BARS/NARS; or

3 Coordinated Dialing Plan.

Call Park Network Wide

Contents

The following are the topics in this section:

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Feature description

Previous to the introduction of Call Park Network Wide, a call in a parked state on a System Park Directory Number (DN) or station set park DN could only be retrieved by an attendant console or a station set located within the same node. The Call Park Network Wide (CPRKNET) feature builds on the existing functionality of Call Park and introduces the following capabilities: Network Call Park, Call Park Expansion and External Call Park Access.

Network Call Park enables an attendant or a station set to park a call on System DN or DN within a Meridian Customer Defined Network (MCDN). This networking capability requires users at parking, parked at, tandem and accessing nodes be equipped with Network Attendant Services (NAS). The parking node refers to the location of the attendant or station set parking the call, the parked at node is the location of the parked call, the tandem node is the routing bridge for the parked call and the accessing node is the location of the user retrieving the parked call.

Call Park Expansion increases the amount of Call Park blocks and number of System Park DNs. With CPRKNET configured, a user can define up to five different Call Park blocks. Each call park block can be separately configured with programmable parameters (such as recall timers). The maximum recall timer is expanded from 240 to 480 seconds and the maximum number of System Park DNs in each block is increased from 50 to 100 directory numbers.

External Call Park Access permits an external caller to retrieve a call in parked stated through either a Direct Inward Dial (DID) trunk or a TIE trunk. The external user must initially be informed that a call has been parked. The external party is informed and can only retrieve the parked call if they know the accessing DN. It is important to note that if a system administrator utilizes the enhancements offered by Call Park Expansion and configures five call park blocks then these System Park DN ranges must be known by all users attempting to access this feature.

Operating parameters

The recall timer and number of System Park DNs expansions are included in base system software. However, the CPRKNET package is required to access the multiple call park blocks and networking capabilities.

Network Call Park does not support Centralized Attendant Service.

The existing Trunk Barring feature ensures that only an appropriate incoming trunk can be connected to a parked party.

The existing Trunk Group Access Restriction (TGAR) feature checks the incoming accessing trunk. A parked call can only be retrieved if the TGAR and Trunk Access Restriction Group (TARG) of the trunks correctly match.

Call Park Expansion

The Primary Call Park Block must be defined for the customer.

Network Call Park

Network Call Park is supported if the network has all nodes connected by MCDN ISDN links with NAS signaling configured. All the current limitations of the NAS feature apply to CPRKNET.

The CPRKNET package must be enabled on both the parking and parked nodes. The package is not required on the tandem node.

The parking node and the parked at node must have a Primary Call Park Block defined.

When the call park recall timer expires on a parked call at another node, the call recalls to the attendant at the parking node regardless of the configuration of the recall park call to attendant (RECA) prompt of the associated call park block. This recall to an attendant occurs even if the call was parked by a station set.

Parked Call External Access

Only a call that is parked on a System Park DN can be retrieved by an incoming trunk. A call parked on a station DN cannot be retrieved by an external caller.

Only incoming Direct Inward Dial (DID) or TIE trunks can retrieve a parked call.

A user does not receive any special indications when retrieving a parked call. The user is connected to the parked call immediately.

Feature interactions

Answer Supervision

If a parked call is connected to an incoming trunk with Answer Supervision, the appropriate messages on the status of the call are sent through the incoming trunk to the far end.

Basic Alternate Route Selection
Network Alternate Route Selection

An Electronic Switched Network (ESN) number can be assigned as the System Park or Station Set DN to a Network Call Park call. A parked call on a System Park DN can be retrieved by a caller outside the parked node via BARS/NARS dialing.

Camp-On

When an attendant attempts to extend a call to a busy station across the network and the busy station returns a Camp-On allow signal, an attendant has the option of camping on a call or continuing with Network Call Park.

Coordinated Dialing Plan

A Coordinated Dialing Plan number can be assigned to a Network Call Park call that the attendant or station set is attempting to park.

Trunk Anti-Tromboning

The Trunk Anti-Tromboning feature is invoked if programmed at all interim Private Branch Exchanges (PBXs) in the call.

Recall to Same Attendant, Network Wide

Network Call Park supports this feature. However, all limitations and restrictions associated with Network Wide Recall to Same Attendant are applicable.

Feature packaging

The Network Call Park and External Call Park Access capabilities of the Call Park Network Wide (CPRKNET) requires package 306 and Network Attendant Services (NAS) package 159. Expansions to the recall timer and the number of System Park DNs are included in Call Park (CPRK) package 33.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 15 – Enable Call Park Network Wide.

2 LD 17 – Set the remote capability at both ends of the ISDN link to Call Park.

3 LD 50 – Add/Change Customer Call Park Data.

4 LD 10 – Enable Call Park for Analog (500/2500 type) telephones.

5 LD 11 – Add/Change Call Park Key on Meridian 1 proprietary telephones.

6 LD 12 – Add/Change Call Park Key on Attendant Consoles.

LD 15 – Enable Call Park Network Wide.

Prompt	Response	Description
REQ:	CHG	Change.
TYPE:	FTR	Features and options.
CUST	xx	Customer number.
- OPT	CPN	Enable Call Park Network Wide. CPA = Enables Call Park. CPD = Disables Call Park (default).

LD 17 – Set the remote capability at both ends of the ISDN link to Call Park.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	ADAN	Action device and number options.
ADAN	CHG DCH xx	Define changes to D-channel xx.
...		
- RCAP	CPK	Define Call Park as a remote capability.

...		
- NASA	YES	Allow Network Attendant Service.
...		

LD 50 – Add/Change Customer Call Park Data.

Prompt	Response	Description
REQ	NEW CHG PRT	New, change, or print.
TYPE	CPK	Call Park data block.
CUST	xx	Customer number.
BLOC	1-5	Call Park data block number. Primary Call Park (block 1) must be defined for Call Park operation. Block 1 must be initially defined before attempting to remove.
CPTM	30-(45)-480	Call Park Timer (in seconds).
RECA	(NO) YES	Call Park Recall to Attendant.
SPDN	(0)-100 xx...x	Number of contiguous system park DNs and first DN of that range.
MURT	xx	Music Route number for parked call.

LD 10 – Enable Call Park for Analog (500/2500 type) telephones.

Prompt	Response	Description
REQ:	NEW CHG	New, or change.
TYPE:	500	Telephone type.
TN	l s c u	Terminal Number.

	c u	For Option 11C.
CLS	XFA	Call Transfer Allowed. XFD = Call Transfer Denied.

LD 11 – Add/Change Call Park Key on Meridian 1 proprietary telephones.

Prompt	Response	Description
REQ:	NEW CHG	New, or change.
TYPE:	xxxx	Telephone type where: aaaa = SL1, 2006, 2008, 2009, 2016, 2018, 2112, 2216, 2317, 2616 or 3000.
TN	l s c u	Terminal Number.
	c u	For Option 11C.
KEY	xx PRK xx TRN xx AO3 xxAO6	Key assignment for Call Park. Key number for Transfer. Three Party Conference. Six Party Conference.

LD 12 – Add/Change Call Park Key on Attendant Consoles.

Prompt	Response	Description
REQ	NEW, CHG	New, or Change.
TYPE	xxxx	Console type.
TN	l s c u	Terminal Number.
	c u	For Option 11C.
KEY	xx PRK	Key number, Call Park.

Feature operation

Call Park Expansion

Attendant Console with Park Key
Attendant Console via Dial Access
Meridian 1 Proprietary Set with Display and Park Key

1 Press PRK key, or dial SPRE + 71 or Call Park FFC.

2 An available System Park DN is displayed. To override this DN, dial another Park DN.

- If number dialed is an available Park DN, the digit display is cleared and only the dialed Park DN is displayed (without SPRE + 71 or CPRK FFC).
- If number dialed is invalid or unavailable station Park DN an overflow tone is heard.
- If number dialed is an unavailable System Park DN, overflow tone is heard. If another System Park DN is available in the Call Park Block, the system assigns this DN. The available System Park DN is displayed and silence is returned.

3 Press PRK key or if using SPRE or FFC press Release RLS key to complete call park.

End of Procedure

Meridian 1 Proprietary Set with Display via Dial Access

1 Press the CONF or TRN key.

2 Dial SPRE + 71 or CPRK FFC.

3 An available Primary System Park DN is displayed. To override this DN dial another Park DN.

- If number dialed is available, digit display is cleared and dialed Park Access ID is displayed (without SPRE + 71 or CPRK FFC).
- If number dialed is an invalid System Park DN or an unavailable station park DN, overflow tone is heard.
- If number dialed is an unavailable System Park DN, but another available System Park DN exists in the Call Park Block, the available System Park DN is displayed. Silence is returned.

4 Press the CONF or TRN key to complete call park.

End of Procedure

Meridian 1 Proprietary without Display Analog (500/2500) type telephones

The Call Park operation on these types of telephones is not affected.

Network Call Park

The existing Call Park operation is modified to accommodate the Network Call Park capabilities of the CPRKNET feature. A user must enter a Park DN that is either a Station Park DN or a System Park DN that is located at another node, within the attendant's or station set's MCDN network.

Attendant Console Meridian 1 Proprietary Set with Display with Park Key Attendant Console via Dial Access

1 Press the PRK key or dial SPRE + 71 or CPRK FFC.

2 An available Primary System Park DN from parking node is assigned and displayed.

3 To override the displayed System Park DN with another Park DN, dial the ESN number and remaining digits.

- At the remote node, if there is an available Park DN, silence is heard. The digit display of the set is cleared and the dialed Park DN is displayed without the SPRE + 71 or CPRK FFC.
- At the remote node, if numbers dialed are invalid or unavailable, overflow tone is heard.
- At the remote node, if the numbers dialed are an unavailable System Park DN but another System Park DN is available in the Call Park Block, the system assigns this DN. The available System Park DN is displayed and silence is returned. If no DN is available and there is no other available DN in the Call Park Block, overflow tone is heard.

4 If using an Attendant Console, press the RLS key, or if using Meridian 1 Proprietary Set with Display, press the PRK key to complete call park.

End of Procedure

Attendant Parking an Extended Call

1 Press the PRK key.

2 Extended party is released and ringback or busy tone is removed. SPRE + 71 + ESN number of the extended call are displayed.

- At the remote node, if there is an available Park Access ID, silence is heard.

3 At the remote node, if numbers dialed are an invalid or unavailable Park DN, overflow tone is heard.

4 Press the RLS key to complete call park.

End of Procedure

Meridian 1 Proprietary Set with Display via Dial Access

1 Press the CONF or TRN key.

2 Dial SPRE + 71 or CPRK FFC.

3 An available Primary System Park DN from the parking node is displayed.

4 To override this with another Park DN, dial the ESN number and digits.

- At the remote node, if there is an available Park Access ID silence is heard. The digit display is cleared and the dialed Park Access ID is displayed without the SPRE + 71 or CPRK FFC.
- At the remote node, if the ESN number is an invalid or unavailable Park DN, overflow tone is heard.
- At the remote node, if dialed System Park DN is not available but there is another available System Park DN in its Call Park Block, the available System Park DN is displayed. Silence is returned.

5 Press CONF or TRN key to complete call park.

End of Procedure

Meridian 1 Proprietary Set without Display with PRK key
Meridian 1 Proprietary Set without Display via Dial Access
Analog (500/2500 type) set

1. Press the PRK, CONF, TRN or perform switchhook flash depending on type of set and key assignment.
2. Dial SPRE + 71 or CPRK FFC.
3. Dial the ESN Number and digits.
   - At the remote node, if there is an available Park DN, silence is heard.
   - At the remote node, if numbers dialed are invalid or unavailable, overflow tone is heard;
4. Press same key in Step 1 or go on-hook to complete call park.

End of Procedure

Canceling Call Park Network Wide during Operation

The procedure for canceling the Call Park Network Wide feature follows the existing operation of canceling Call Park. However, once an overflow tone is heard, the attendant or station set must cancel the Call Park attempt and restart the Call Park process. The operation of canceling Call Park on different terminals is described below.

Attendant Console

Press the RLS DEST Key. Call Park is canceled and the original call is reconnected to the attendant console.

Meridian 1 Proprietary Set

Press the flashing DN Key. Call Park is canceled and the original call is reconnected to the attendant console or the station set.

Analog (500/2500 type) Set

Complete a switchhook flash. Call Park is canceled and the original call is reconnected to the attendant console or the station set.

External Call Park Access

External Call Park Access allows a parked call on a System Park DN to be retrieved by an external user via an incoming DID or TIE trunk. This capability requires that the node where the call is parked (parked at node) is equipped with the CPRKNET feature and the Primary Call Park Block is defined. To enable external access capabilities, calls must be parked against a System Park DN.

1 Call Parked.

2 External access caller must be notified or know where the parked call is located.

3 Depending on specific dialing plan configuration, the external access caller must dial one of the following to access the call in parked state:

- for Coordinated Dialing Plan, dial System Park DN;
- for ESN, dial Access Code + Location Code + System Park DN;
- for DID, dial area code + Local Exchange + System Park DN; or
- for DISA, dial DISA number + (Authorization Code + DISA Security Code) + System Park DN.

———————— ***End of Procedure*** ————————

Call Pickup Network Wide

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Feature description

Large installations exceeding the capacity of a single private exchange, or requiring network solutions to security requirements (as in the case of hospitals, chemical companies, nuclear power plants, etc.) have presented the possible circumstance of their employees working in close proximity to each other, but not sharing the same telephone switch. This raises the need to make available network-wide those features that were previously only required locally; Call Pickup is one such feature.

The Call Pickup Network Wide feature enables the following functionalities to be extended over a Meridian Customer Defined Network ISDN network:

- Ringing Number Pickup
- Directed Call Pickup by Group Number

- Directed Call Pickup by DN
- Display Call Pickup

With the exception of Display Call Pickup, user operation of the above features remains unchanged. To display Call Pickup, press the Display key, followed by the Call Pickup key. Display Call Pickup is modified so that the Ringing Number Pickup (RNP) key winks for five seconds once a local or remote ringing DN is found and displayed. During this time, the user can press the RNP key to initiate a Call Pickup directed to the displayed DN.

With Call Pickup Network Wide, users must be linked to the same Call Pickup group regardless of network location. Each Ringing Number Pickup Group may be linked to a Speed Call List (SCL) which is used when there is not an applicable local set to pick up. Different groups may be assigned to different SCLs.

To be able to route calls through the network from one originating node to a destination node, an ISDN Private Integrated Services Network Exchange (PINX) DN is defined for each node in the network. The ISDN PINX DN is a DN taken from the customer's numbering plan used to aid with the routing of network calls. It does not correspond to a real terminal on the node, so can never be busy. Each SCL contains a list of PINX DNs which correspond to the remote nodes or customers to be searched. Thus, the purpose of the Speed Call List is to let the system know where to look in the network to pick up the call. If a pickup group is linked to a Speed Call List, this group is considered as being network wide.

The search is conducted in an ascending order as programmed in the Speed Call List (i.e., entry 0 first). This Speed Call list is used when there is not an applicable local set to pick up.

When a network search is performed, a slight delay occurs before a call is connected or rejected, during which time the set will receive silence. This delay is traffic dependent. If for any reason the call cannot be rerouted to the requesting party, the call will ring again at the originally dialed DN and the requesting party will receive overflow tone.

Operating parameters

Call Pickup Network Wide is not supported over a Virtual Network Services (VNS) or QSIG link.

A Speed Call List must be configured with the PINX DNs of the remote switch. The local PINX DN must be configured in the Customer Data Block (LD 15).

If on one single node two calls are ringing at the same time, the call with the higher priority will be picked up. But if on two nodes two calls are ringing at the same time (one call on each node), the call on the node searched first will be picked up (i.e., a normal ringing call on the local node is picked up before a priority ringing set on a remote node).

Feature interactions

Access Restrictions

All access restrictions applicable to Network Alternate Route Selection (NARS)/Basic Alternate Route Selection (BARS) calls (including Class of Service, Network Class of Service, Trunk Barring (TBAR), and New Flexible Code Restriction (NFCR) restrictions based on digit manipulation) apply to a redirected call from the receiving node to the requesting node. This means that there are no limitations added to the access restriction checks for calls being redirected by the Call Pickup Network Wide feature.

If the call is blocked because of any of these access restrictions on either the receiving, tandeming, or requesting node, the originally called party is re-rung and the party attempting to pick up the call receives overflow tone.

Attendant-Extended Calls

The Call Pickup Network Wide feature can be used to pick up attendant-extended calls to a remote station.

Automatic Call Distribution (ACD)

The Call Pickup Network Wide feature cannot be used to pick up a call to an ACD DN. Calls to ACD DNs will be skipped and queue scanning will search for another ringing call.

A call to an non ACD DN on an ACD set can be picked up as a normal call. A call transferred by an ACD agent can be picked up as a call transferred by a normal set. In addition, it is possible to pick up as a normal call a call originated by an ACD set on a non ACD DN key.

Call Back Queuing

A call redirected by the Call Pickup Network Wide feature cannot be subject to Call Back Queuing.

Call Collision (Glare)

A call redirected by the Call Pickup Network Wide feature will be treated as for normal ISDN calls. A new trunk will be found if possible; otherwise, the requesting party will receive overflow tone.

Call Park

The Call Pickup Network Wide feature cannot be used to pick up parked calls. A recall of a parked call can be picked up, in which case the call is unparked and answered by the requesting party.

Called Party Name Display

Network Call Party Name Display information will be exchanged during Call Pickup Network Wide calls if the sets involved in the call would normally exchange the information for calls over the routes that have been used for the original call and the call pickup. Conversely, if Network Called Party Name Display would not operate for a normal call from the originating party to the terminating party, the service will not be supported when Call Pickup Network Wide is involved.

Name displayed on the requesting party

If a remote ringing station is picked up, the originating party's name is always displayed, independent of the requesting party's Class of Service.

Call Redirection
Network Call Redirection

Call redirection only has an interaction if the call being picked up has already been redirected. In this case, the original redirecting number will be passed on instead of the DN of the set from which the call is being picked up. The redirection reason displayed will remain as the previous displayed redirection reason if the Called Party Name Display is involved.

Call Transfer
Network Call Transfer

A call may be picked up before or after the transferring party has completed the transfer.

For pickup before transfer completion, the transferring party is displayed updated information by the Call Pickup Network Wide feature when the call is picked up. Then, when the transfer is completed, normal call transfer information is exchanged by each party involved in the final call.

For pickup after call transfer completion, everything happens as if the call had been made directly from calling to ringing party. After pickup is performed, displays are updated as for normal Call Pickup.

Call Waiting

Call Waiting calls cannot be picked up.

Call Waiting Redirection

A call that is redirected by the Call Waiting Redirection feature to the active set's Call Forward No Answer DN may be picked up.

Calling Party Number Privacy

The "Privacy Indicator" provided by the Calling Party Number Privacy feature is respected when the requesting party's display is updated after the ringing call has been picked up successfully (i.e., if the originating party has specifically requested privacy), the originating party's name and/or DN is not displayed on the requesting party's display.

Conference

Call Pickup Network Wide may be used to pickup an enquiry call from a conference, subject to the same limitations as apply to Call Transfer.

Data Calls

The Call Pickup Network Wide feature cannot be used to pick up data calls.

Dial Intercom

The Dial Intercom feature is not supported network wide. Any pickup attempt from a distant node to a local intercom call will be rejected, because the far-end user is considered as not being in the same intercom group.

Display of Calling Party Denied

The Class of Service DDGA/DDGD for digit display and NAMA/NAMD for name display are respected when the requesting party's display and the originating party's display are updated after the ringing call has been picked up successfully.

Group Call

The Group Call feature does not allow having a remote party in a Group Call list. Therefore, a Group Call cannot be picked up by a remote station. If during the network scanning a Group Call is found, it will be ignored and the network scanning will continue.

ISDN Basic Rate Interface (BRI)

An ISDN BRI terminal cannot initiate a call pickup, and a call ringing at an ISDN BRI terminal cannot be picked up.

ISDN QSIG Name Display

When a QSIG call with name display presentation allowed is picked up on a MCDN, the calling party's name information is displayed on the set that answers the call. If presentation restricted is defined, then name information is not displayed.

Multi-Tenant Service

The Call Pickup Network Wide is not supported in a multi-tenant environment.

Network HOT Type D Intercom

It is not possible to pick up a HOT type I call; however, it is possible to pick up a HOT type D call.

Network Routing Restrictions

NARS Anti-Tromboning

At the receiving node where the set is ringing, NARS Anti-Tromboning does not apply to a call being redirected by the Call Pickup Network Wide feature.

Network Attendant Service/ISDN Call Connection Limitations

ISDN Call Connection Limitations (ICCL) apply to Call Pickup Network Wide calls. If the call being redirected by the Call Pickup Network Wide feature is blocked due to one of the ICCL limitations (e.g., Tandem Threshold, Call Redirection Threshold, Number of MU/A Law Conversions, Disconnect Supervision), the originating call will re-ring the originally called party and overflow tone is given to the requesting party.

Night DN

The Call Pickup Network Wide feature can be used to pick up a call to the night number if it is ringing an ordinary station (i.e., PBX (500/2500), 16-button Dual-tone Multifrequency, or proprietary set).

Off-Hook Queuing

A call redirected by the Call Pickup Network Wide feature cannot be the subject of Off-Hook Queuing.

Path Optimization

Network Attendant Services (NAS)

NAS Anti-Tromboning is supported by the Call Pickup Network Wide feature.

Trunk Route Optimization Before Answer

The Call Pickup Network Wide feature does not support Trunk Route Optimization Before Answer.

Secondary DN

For calls to, from, or picked up from a secondary DN, all line IDs displayed after a successful pickup will follow the current rules for Calling Line ID and Connected Number. The exception is for Display Call Pickup; if the call is ringing at a secondary DN, the line ID on the requesting user’s display will be the ringing DN (that is, the secondary DN). Once the pickup is completed, the displays will be as for normal pickup.

Vacant Number Routing

The Call Pickup Network Wide feature fully supports Vacant Number Routing (VNR) if the route or the set of routes given by the customer for VNR contains at least one MCDN link.

Virtual Network Services

The Call Pickup Network Wide feature will not work in conjunction with the Virtual Network Services feature.

Feature packaging

The Call Pickup Network Wide feature is included in Integrated Services Digital Network (ISDN) package 145.

The following packages are also required:

- Directed Call Pickup (DCP) package 115;
- Advanced ISDN Network Services (NTWK) package 148; and
- 2.0 Mbit Primary Rate Interface (PRI2) package 154.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 10 – Assign a Ringing Pickup Group number to an analog (500/2500 type) telephone.

2 LD 11 – Assign a pickup group to a Meridian 1 proprietary telephone.

3 LD 15 – Define the customer's Private Integrated Network Identifier (PNI) and Private Integrated Services Network Exchange (PINX) DN.

4 LD 57 – Define the Flexible Feature Codes (FFCs) used to activate Call Pickup and Directed Call Pickup from a an analog (500/2500 type) telephone. The FFCs may also be used on Meridian 1 proprietary telephone sets.

5 LD 18 – Configure a Speed Call List.

6 LD 18 – Define the Ringing Number Pickup Groups that are network wide by linking them to one of the previous defined Speed Call Lists. Different RNPGs may be linked to different Speed Call Lists.

7 LD 17 – Define the software Release ID at the far end of the D-channel.

8 LD 15 – Define the special prefix code (SPRE) to be able to activate the Call Pickup features by dialing SPRE + xx.

9 LD 16 – Configure the PNI on the route. This PNI must correspond to the one configured in LD 15 on the target (remote) node.

LD 10 – Assign a Ringing Pickup Group number to an analog (500/2500 type) telephone.

Define the Class of Service for Call Pickup features that are allowed to be activated from this station.

Prompt	Response	Description
REQ:	CHG	Change.
TYPE:	500	Telephone type.
TN	l s c u	Terminal Number.
	c u	For Option 11C.
...		
RNPG	(0)-4095	Ringing Number Pickup Group (RNPG). If the RNPG is set to 0 (the default) on a station, it is not possible to pick up any call ringing this station from any other set. Enter 0 to remove a station from the RNPG. ***Note:*** If the RPNG is two or more digits in length, it must be configured in the Customer Data Block (LD 15), so that it may use the Group Pickup key. See the procedure which follows LD 11.
...		
CLS	(PUD) PUA	Ringing Number Pickup (denied) allowed.
	(DPUD) DPUA	DN pickup (denied) allowed.
	(GPUD) GPUA	Group pickup (denied) allowed.

LD 11 – Assign a pickup group to a Meridian 1 proprietary telephone.

Define with the Class of Service which of the Call Pickup features are allowed to be activated from this station.

The configuring of different pickup keys is optional, since the Call Pickup and Directed Call Pickup features can be activated by dialing the SPRE + xx or by dialing a Flexible Feature Code. The Digit Display key is needed for the Display Call Pickup feature.

Prompt	Response	Description
REQ:	CHG	Change.
TYPE:	aaaa	Telephone type, where: aaaa = SL1, 2006, 2008, 2009, 2016, 2018, 2112, 2216, 2317, 2616, and 3000.
TN	l s c u	Terminal Number.
	c u	For Option 11.
...		
RNPG	(0)-4095	Ringing Number Pickup Group (RNPG). If the RNPG is set to 0 (the default) on a station, it is not possible to pick up any call ringing this station from any other set. Enter 0 to remove a station from the RNPG. ***Note:*** If the RPNG is two or more digits in length, it must be configured in the Customer Data Block (LD 15), so that it may use the Group Pickup key. See the procedure which follows.
...		
CLS	(PUD) PUA	Ringing Number Pickup (denied) allowed.
	(DPUD) DPUA	DN pickup (denied) allowed.
	(GPUD) GPUA	Group pickup (denied) allowed.
...		
KEY	xx RNP yyyy	Key number, Ringing Number Pickup, Pickup Group number (optional). If the Group number is not entered, the key will pick up calls in the group assigned to the station. If the Group number is entered, the key will pick up calls in the specified group yyyy.
KEY	xx GPU	Key number, Group Number Pickup.

KEY	xx DPU	Key number, DN Pickup.
...		
KEY	xx DSP	Key number, Digit Display.

LD 15 – Define the customer's Private Integrated Network Identifier (PNI) and Private Integrated Services Network Exchange (PINX) DN.

Prompt	Response	Description
REQ:	CHG	Change.
TYPE:	NET	Networking data.
CUST	xx	Customer number.
...		
ISDN	YES	Allow ISDN for this customer.
- PNI	1-32700	Define the Private Network Identifier.
- PINX_DN	xx...x	Node DN, up to seven digits with DN Expansion package 150.
	X	Enter X to remove.
...		

LD 57 – Define the Flexible Feature Codes (FFCs) used to activate Call Pickup and Directed Call Pickup from a an analog (500/2500 type) telephone. The FFCs may also be used on Meridian 1 proprietary telephone sets.

Prompt	Response	Description
REQ	NEW CHG	New, or change.
TYPE	FFC	Flexible Feature Code.
CUST	xx	Customer number.
FFCT	(NO) YES	Flexible Feature Confirmation tone.

CODE ...	mmmm	Specific FFC type.
- PUDN	PUDN xxxx	Pickup DN code. Enter the Flexible Feature Code.
- PUGR	PUGR xxxx	Pickup Group code. Enter the Flexible Feature Code.
- PURN	PURN xxxx	Pickup Ringing Number code. Enter the Flexible Feature Code.
...		

LD 18 – Configure a Speed Call List.

This Speed Call List will be used by a Ringing Number Pickup Group (RNPG) or a set of RNPGs as a search list to scan the MCDN network.

The Speed Call List entries should contain digits which can be used to route a network Call Pickup request to a remote node (e.g., mainly the ISDN PINX DNs of the remote nodes which will be scanned after a network Call Pickup request).There must be no gaps in the Speed Call List (i.e., each Speed Call List entry should be present).

Due to the time it takes to scan the remote node, it is strongly recommended to configure less than six entries in the Speed Call List.

Prompt	**Response**	**Description**
REQ	NEW CHG	New, or change.
TYPE	SCL	Speed Call List.
LSNO	0-8190	Speed Call List number
...		
DNSZ	4-(16)-31	Maximum size of DNs allowed for Speed Call list.

SIZE	1-1000	Maximum number of DNs allowed in Speed Call list. ***Note:*** The size cannot be greater than the value entered against the STOR prompt below.
...		
STOR	000-999 xxxx	Speed Call List entry number and digits (PINX DN) stored against it. ***Note:*** The STOR entry cannot be blank.

LD 18 – Define the Ringing Number Pickup Groups that are network wide by linking them to one of the previous defined Speed Call Lists. Different RNPGs may be linked to different Speed Call Lists.

Prompt	Response	Description
REQ	NEW CHG OUT	New, change, or remove.
TYPE	CPNW	Call Pickup Network Wide data.
CUST	xx	Customer number.
LSNO	0-8190	A Speed Call List associated with Call Pickup network wide groups.
- GRP	0-4095 X0-4095	Ringing Number Pickup Group (RNPG) using this Speed Call List. Repeat for all groups sharing the same list. Enter <CR> to reprompt LSNO. Enter X to remove an RNPG.

LD 17 – Define the software Release ID at the far end of the D-channel.

Prompt	Response	Description
REQ	CHG	Change I/O device.
TYPE	ADAN	Action Device and Number.
ADAN	CHG DCH 0-63	Change D-channel information
...		

- RLS ...	21	Release ID of the switch at the far end of the D-channel.

LD 15 – Define the special prefix code (SPRE) to be able to activate the Call Pickup features by dialing SPRE + xx.

Prompt	Response	Description
REQ:	CHG	Change.
TYPE:	FTR	Customer features and options
CUST	xx	Customer number.
...		
- SPRE	xxxx	Special Prefix number for this customer.
...		

LD 16 – Configure the PNI on the route. This PNI must correspond to the one configured in LD 15 on the target (remote) node.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	RDB	Route data block.
ROUT	xx	Route number.
...		
ISDN	YES	ISDN is allowed on this route.
- PNI	1-32700	Define the Private Network Identifier.

Feature operation

Display Call Pickup

This feature is only supported on Meridian Digital Telephones (with the exception of the M2317, and M3000).

1 Press the DSP key.

- The DSP key is lit.

2 Press the RNP key.

- The RNP key is flashing.

3 The display will show: Hbbbb1 Haaaa2

Where 1 = The DN of the originating party if it is local or available from CLID. If no CLID is available for a remote, originating party, either the route access code and the route member number are displayed if the ringing set is local, or dashes ("----") are displayed if the ringing set is remote. This is because the route access code of a route has no meaning on the requesting node. The "H" is displayed if the DN can be determined and it is located on another node.

Where 2 = The DN of the originally called (ringing) party. The "H" is displayed if the DN is located on another node than the requesting party.

- The RNP key is winking for five seconds.

4 Press the DN key.

- The DN key is lit.

5 Press the RNP key. If the RNP key is pressed during the five seconds it is winking, Directed Call Pickup by DN is attempted. If the RNP key is dark when pressed, normal Ringing Number Pickup treatment takes place.

- The RNP key is flashing.

6 You are connected to the call.

- The RNP key becomes dark.
- For sets with display the following is shown:
  "Name"1
  Hcccc2 Hbbbb3 "P"4

Where 1 = Either the originating party's name or the originally called party's name is displayed depending on the requesting party's Class of Service.

Where 2 = The DN of the originating party if it is local or available from CLID. If no CLID is available for a remote, originating party, either the route access code and the route member number are displayed if the ringing set is local, or dashes ("----") are displayed if the ringing set is remote. This is because the route access code of a route has no meaning on the requesting node. The "H" is displayed if the DN can be determined and it is located on another node.

Where 3 = The DN of the originally called party. The "H" is displayed of the DN is located on another node than that of the requesting party.

Where 4 = The string defined in LD 95 for Call Pickup. The default is "P"

End of Procedure

Ringing Number Pickup

To answer a call in your Call Pickup group from a Meridian Digital Telephone:

1 Lift the handset, or press a DN key.

- The DN key is lit (if pressed).

2 Press the RNP key or dial SPRE + 3 or dial PURN FFC.

- The RNP key is flashing.

3 You are connected to the call.

- The RNP key becomes dark.
- For sets with display, refer to step 3 under "Display Call Pickup".

End of Procedure

To answer a call in your Call Pickup group from an analog (500/2500 type) telephone:

1 Lift the handset.

2 Dial SPRE + 3 or PURN FFC.

3 You are connected to the call.

End of Procedure

Directed Call Pickup by Group Number (Group Pickup)

To answer a call in another Call Pickup group from a Meridian Digital Telephone:

1 Lift the handset, or press a DN key.

- The DN key is lit.

2 Press the GPU key or dial SPRE + 94 or dial PUGR FFC.

- The GPU key is lit (if pressed).

3 Dial the pickup group number.

- Once the group number is dialed completely, the GPU key is flashing to indicate that a search or scan is in progress.

4 You are connected to the call.

- The GPU key becomes dark.
- For sets with display, refer to Step 3 under “Display Call Pickup”.

———————— ***End of Procedure*** ————————

To answer a call in another Call Pickup group from an analog (500/2500 type) telephone:

1 Lift the handset.

2 Dial SPRE + 94 or PUGR FFC.

3 Dial the pickup group number.

4 You are connected to the call.

———————— ***End of Procedure*** ————————

Directed Call Pickup by Directory Number (DN Pickup)

To answer a call on a specified DN from a Meridian Digital Telephone:

1 Lift the handset, or press a DN key.

- The DN key is lit.

2 Press the DPU key or dial SPRE + 95 or dial PUDN FFC.

- The DPU key is lit (if pressed).

3 Dial the extension number.

- Once the group number is dialed completely, the DPU key is flashing to indicate that a search or scan is in progress.

4 You are connected to the call.

- The DPU key becomes dark.
- For sets with display, refer to Step 3 under “Display Call Pickup”.

——————————— ***End of Procedure*** ———————————

To answer a call on a specified DN from an analog (500/2500 type) telephone:

1 Lift the handset.

2 Dial SPRE + 95 or PUDN FFC.

3 Dial the extension number.

You are connected to the call.

——————————— ***End of Procedure*** ———————————

Calling Line Identification (CLID)

Contents

The following are the topics in this section:

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Information display on telephone sets and terminals 469
Operating parameters 472
Feature interactions 473
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Feature operation 473

Feature description

The Calling Line Identification (CLID) feature sends a set's designated number across the ISDN network to a digit display at the terminating end of a call. The CLID display lasts for the duration of the call.

The CLID display feature is supported for Meridian 1 to Meridian 1, and Meridian 1 to Central Offices that comply with supported protocols. It is also supported across the 1.5/2.0 Mb Gateway, if numbering plans are consistent on both sides of the gateway.

Information display on telephone sets and terminals

The ISDN features listed in this section can be used on all Nortel Networks sets. However, not all sets or terminals provide information displays.

Displayphone. The Meridian 1 Displayphone allows the full display of CLID information.

Other sets and terminals. The following devices (if equipped with a digit display) can receive and display a CLID name:

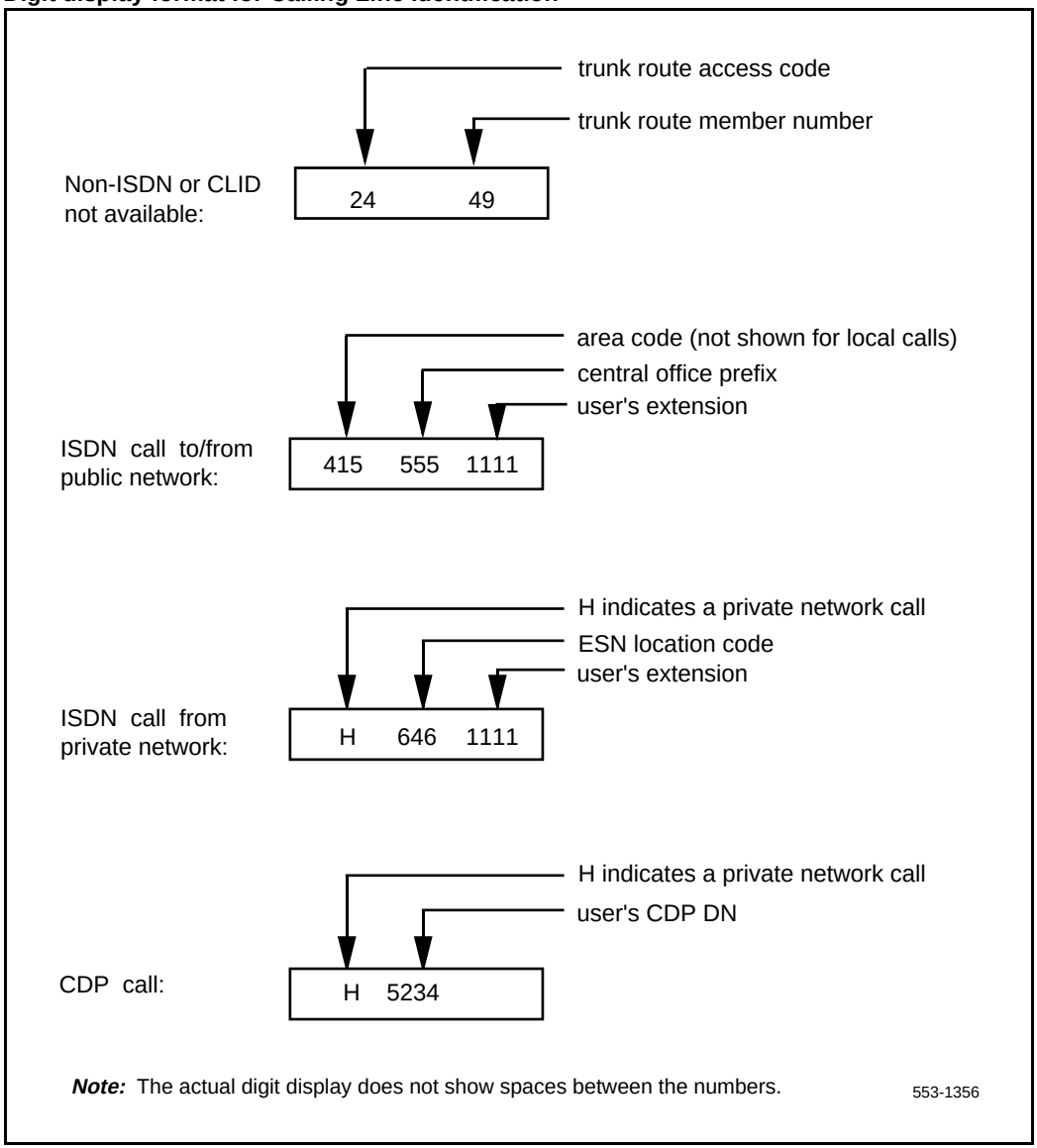
- Attendant Consoles
- Meridian 1 sets with digit display
- Digital sets (M2317)
- Meridian 1 Touch Sets (M3000)
- ASCII terminals with an Add-on Data Module (ADM)
- M2008, M2016S, M2216ACD, M2616 when equipped with displays

Digit display format

As shown in Figure 47, the digit display at the telephone set receiving the call will display:

- If the CLID display is unavailable because the call was not routed on ISDN routes for the entire call, the trunk route access code and trunk route member number are displayed.
- For public networks, CLID displays the standard North American Numbering Plan 7- or 10-digit number, depending on the number dialed.
- For a private network over ESN, the CLID displays an “H” followed by xxxx yyyyy, where xxxx = a four digit Home Location Code (HLOC) and yyyy = a four digit DN.
- For a private network over CDP, the CLID displays a four digit LSC (Local Steering Code) followed by one of the following:
  - — the extension’s trailing digits (forming the CDP DN) when CDP is equipped
  - — the calling telephone’s extension

Figure 47
Digit display format for Calling Line Identification



Note: The actual digit display does not show spaces between the numbers.

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CLID on outgoing calls

The calling party number that is sent out with the call SETUP message on the D-channel is based on:

- the numbering plan (private or public);
- the customer option configured in the Customer Data Block (LD 15), either Prime Directory Number (PDN) or Listed Directory Number (LDN);

  Note: An Attendant Console can only be assigned an LDN.

- the Class of Service (COS) assigned to the set calling set.

If the numbering plan is private, the PDN is sent, regardless whether PDN or LDN is configured as the customer option.

If the numbering plan is public:

- if the customer option is set to LDN, then the set's Listed Directory is sent;
- if the customer option is set to PDN, either the Prime Directory Number or Listed Directory Number is sent, depending on the Class of Service (COS) assigned to the calling set in LD 10 or LD 11.

For private network calls, the calling party number consists of either the Electronic Switched Network (ESN) location code and the DN or the Coordinated Dialing Plan (CDP) DN. If the Prime DN is less than four digits, zeros are appended to create a four digit DN. If it is more than four digits, the last four numbers are used to identify the DN. For public network calls, it is the standard North American Numbering Plan seven or ten digit number.

CLID on incoming calls

For incoming calls across the ISDN network, the CLID received over the D-channel is displayed instead of the trunk route access code and trunk member number.

Operating parameters

There are no operating parameters associated with this feature.

Feature interactions

There are no feature interactions associated with this feature.

Feature packaging

This feature is included in base Meridian 1 System Software.

Feature implementation

There are no specific implementation procedures for this feature.

Feature operation

No specific operating procedures are required to use this feature.

Calling Line Identification in CDR

Contents

The following are the topics in this section:

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Operating parameters 478
Feature interactions 478
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Feature implementation 479
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Feature operation 481

Reference list

The following are the references in this section:

- *Call Detail Recording: Description and Formats* (553-2631-100)

Feature description

Call Detail Recording (CDR) records information about selected calls for accounting purposes. For each call, CDR identifies the calling and called parties and notes the time and duration of the call. A record describing the complete call is output by the Meridian 1 system when the call is terminated. The following five recording options are available and can be specified by the customer in any combination for each trunk route:

- all outgoing calls
- all outgoing toll calls
- outgoing answered calls

- outgoing answered toll calls, and
- all incoming calls.

For detailed descriptions of the Call Detail feature, please refer to *Call Detail Recording: Description and Formats* (553-2631-100).

The Calling Line ID in CDR feature is an enhancement to the CDR feature. The description which follows applies to a stand-alone as well as an ISDN PRI environment.

If the Calling Line ID in CDR feature is enabled, the CLID number is included in Call Detail Recording (CDR) records. This gives the Meridian 1 customer the calling station's ID, even from a tandem node. This information allows the customer to charge the calling party for services rendered in connection with an incoming call. For example, calls to an attorney can be accurately charged to the calling client.

The CLID information in the call SETUP message is added to all applicable CDR message types, in both TTY message format and the compressed binary formats for downstream processing. If the CLID information is not included in the SETUP message, it cannot be printed.

In the TTY output, the CLID information is printed on the second line, as shown in Table 3. The field is always 16 characters: the actual CLID digits, followed by **X**'s to total 16.

Table 40
CLID number in the TTY output

Rec Type	Rec No	Cust No	OrigID	TerID	AuxID III.s.cc.uu	Date mm/dd	Time hh:mm	Duration hh:mm:s	Digits
N	001	00	DN499	A001000	027.1.02.1	06/28	10:14	00:00:20	95559124
N	002	00	T002001	DN5000		06/28	10:15	00:00:40	
95552222xxxxxxxx									

Note: The CLID field always displays 16 characters. The feature inserts an “x” for each missing character.

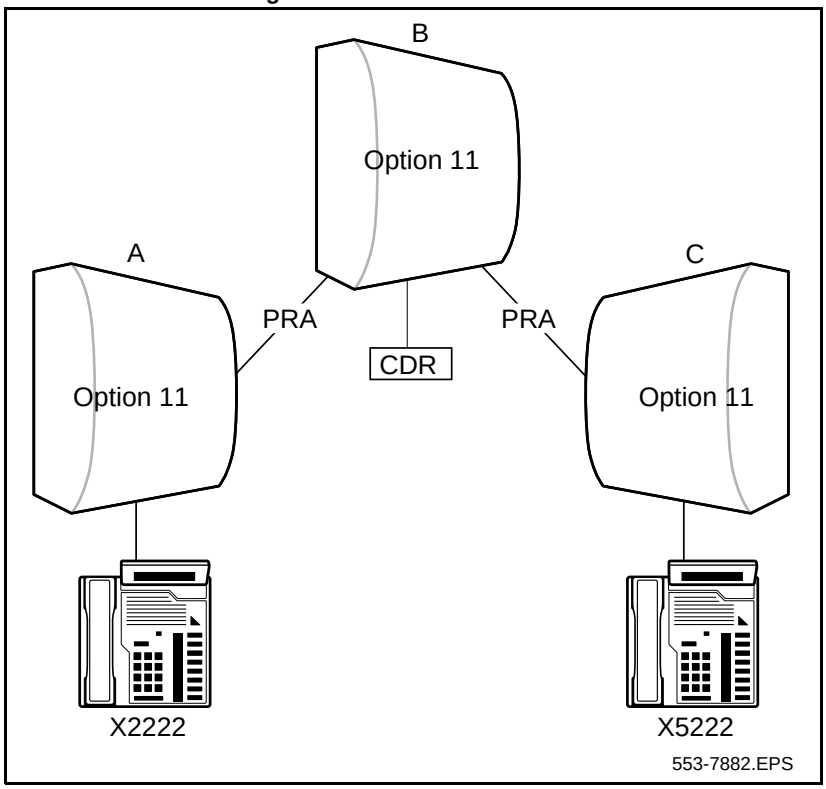
This service provides the addition of a Calling Line Identification (CLID) field in the Call Detail Record (CDR).

The addition of the CLID field allows customers to charge back the calling party for services rendered in connection with their incoming calls. For example, calls placed to a service centre may be charged back to departments receiving the service, or calls placed to a consultant for the time spent with the client.

Another use of CLID in CDR feature is to capture the actual calling DN at the tandem PBX. Figure 48 illustrates a network with three Meridian 1 switches. When a user on PBX "A" calls PBX "C" through PBX "B", the caller’s CLID from PBX "A" can be captured on the CDR at PBX "B".

In the following example DN 2222 on PBX A is calling DN 5222 on PBX C where PBX B is used as a tandem PBX. PBX B's CDR captures the actual extension (X2222) of the caller.

Figure 48
CDR in Multi-site Configuration



Operating parameters

There are no operating parameters associated with this feature.

Feature interactions

INIT ACD Queue Call Restore

Call information associated with Calling Line Identification (CLID) is lost after system initialization and call restoration.

Feature packaging

This feature requires the Calling line Identification in Call Detail Recording (CCDR) package 118. The following packages are also required:

- Call Detail Recording (CDR) package 4;
- Call Detail Recording on Teletype Terminal (CTY) package 5;
- Network Alternate Route Selection (NARS) package 58;
- Integrated Services Digital Network (ISDN) package 145;
- ISDN signaling Link (ISL) package 147; or
- 2.0 Mb Primary Rate Interface (PRI2) package 154

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 17 – Change the Configuration Record to enable CLID.

2 LD 15 – Change the Customer Data Block to configure CLID.

3 LD 17 – Allow CDR to be printed on the TTY terminal.

4 LD 16 – Allow CDR records in the Trunk Route Data Block.

It is assumed that ISDN PRI has already been configured for the customer.

LD 17 – Change the Configuration Record to enable CLID.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	PARM	Change parameters.
...		
CLID	YES	Enable CLID.

LD 15 – Change the Customer Data Block to configure CLID.

Prompt	Response	Description
REQ:	NEW CHG	Add or change a customer.
TYPE:	NET	Networking Data.
CUST	xx	Customer number.
ISDN	YES	Change ISDN options.
- PNI	1-32700	Private Network Identifier.
CLID	YES	Calling Line Identification.
- SIZE	xx	Specify maximum number of CLID entries needed.
-INTL	xx	Country code (1-4 digit). X to remove.
- ENTRY	xx	CLID entry to be configured.
...		
- PFX1	xxxx	Prefix (area) code for International PRI.
- PFX2	xxxx	Central Office Prefix for IPRA.
- HNPA	100-999	Home Number Plan Area code.
- HNXX	100-999	Prefix for Central Office.
- HLOC	100-9999	Home Location Code (ESN).
- LSC	xxxx	Local steering code.
- CNTP	(PDN) LDN	CLID feature displays the set's Prime DN. CLID feature displays the customer's Listed Directory Number (LDN).
- RCNT	0-(5)	Maximum inter-node hops in a network redirection call.

Note: Attendant Consoles have only a Listed Directory Number (LDN).

LD 17 – Allow CDR to be printed on the TTY terminal.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	ADAN	All input/output devices.
ADAN	CHG TTY XX	Change I/O device where xx = port.
...		
USER	CTY	Use the TTY for CDR records.

LD 16 – Allow CDR records in the Trunk Route Data Block.

Prompt	Response	Description
REQ	NEW CHG	New, or change.
TYPE	RDB	Route Data Block.
CUST	xx	Customer number.
...		
CDR	YES	Allow CDR.
- INC	YES	Print CDR information for CLID on incoming trunks.

Feature operation

No specific operating procedures are required to use this feature.

CLID on Analog Trunks for Hong Kong (A-CLID)

Contents

The following are the topics in this section:

Feature description 483
Operating parameters 484
Feature interactions 484
Feature packaging 484
Feature implementation 484
Feature operation 484

Reference list

The following are the references in this section:

- *Features and Services* (553-3001-306)

Feature description

With the Calling Line Identification on Analog Trunks (A-CLID) feature and the DXUT-A card (NTRB37AA), on an incoming Central Office (CO) call, Meridian 1 can extract information such as:

- Calling Party Number
- Calling Party Name
- Reason for absence of Calling Party Number or Name (if necessary)

The A-CLID information is treated similar to ISDN CLID for delivery to other modules and applications in the system, including the display on digital telephones and consoles at the local node and other network nodes (if any).

You can enable or disable A-CLID on an individual trunk port basis.

The A-CLID information passes to the terminating party, which includes:

- Trunks - ISDN (PRI/BRI/QSIG), R2MFC (DTI/DTI2, Analog)
  - — Calling Party Number information can be tandemed over all ISDN and R2MFC interfaces
  - — Calling Party Name information can be tandemed only on SL1 and QSIG ISDN interfaces. R2MFC does not support name information.
- Terminals - Attendant Consoles, Telephones (CLASS, 2208 with display, 2216, 2616, 2317, 5317, M3000, M3902, M3903, M3904, M3905)
- Applications - Call Pilot, Customer Controlled routing, Meridian Mail, Meridian Link, Symposium Call Center Server (calling party number only)

More detailed information on A-CLID may be found in *Features and Services* (553-3001-306).

Operating parameters

There are no operating parameters associated with this feature.

Feature interactions

There are no feature interactions associated with this feature.

Feature packaging

This feature is included in base Meridian 1 System Software.

Feature implementation

There are no specific implementation procedures for this feature.

Feature operation

No specific operating procedures are required to use this feature.

Calling Party Privacy

Contents

The following are the topics in this section:

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Feature description

The Calling Party Privacy (CPP) feature enables the Meridian 1 to support the blocking of a Calling Party's Number and Name from being displayed at the terminating set on a per-call basis. Users can dial a Calling Party Privacy code (e.g., *67 from a Meridian 1 proprietary set or 1167 from an analog (500/2500 type) set) to prevent their telephone number and name from being displayed on a receiving telephone across the Public Switched Telephone Network (PSTN). Internal calls within the Meridian 1 will have originating numbers or names displayed even though the originating call has requested privacy.

This feature also allows a per-line blocking Class of Service to be programmed for station sets for public network calls. This relieves the user from having to dial the Flexible Feature Code (FFC) for every call, but in every other way is equivalent to the per-call blocking.

Depending on the trunk route configuration, public network numbers which tandem over the Meridian 1 Meridian Customer Defined Network (MCDN), prior to exiting to the PSTN, Privacy Indicator will be passed along if dialed by the originator. This means that users can be sure that their privacy wishes are respected whether the call exits directly at the originating node, or is given alternate routing through a private network.

However, if private network nodes are connected by non Integrated Services Digital Network (ISDN) Electronic Switched Network (ESN) trunks, the complexity of the signaling precludes the transmission of the Privacy Indicator. To compensate for this, outgoing Central Office (CO), Foreign Exchange (FEX), Wide Area Telephone Services (WATS), and Direct Inward Dialing (DID) trunks, may be configured to automatically generate a Privacy Indicator for calls received from incoming non-ISDN trunks.

A Privacy Indicator is used to signify that a call is a Calling Party Privacy call. For an outgoing non-Integrated Services Digital Network (ISDN) trunk call, the Privacy Indicator is defined in the outgoing trunk route as a digit string (e.g., *67). No Privacy Indicator is expected for an incoming non-ISDN trunk call. For an ISDN call between two Meridian 1 switches, the Privacy Indicator is represented by setting the Presentation Indicator field to “Presentation Restricted” in the Calling Party Number Information Element (IE) and the Calling Party Name Display (CPND) Indicator to “Presentation Denied” in the Display IE.

For an outgoing ISDN call to the Public Exchange/Central Office, the Privacy Indicator is represented by setting the Presentation Indicator field to “Presentation Restricted” in the Calling Party Number IE and excluding the Display IE with the CPND information. An incoming ISDN call is marked as a CPP call (i.e., carries the Privacy Indicator) if the Presentation Indicator field is set to “Presentation Restricted” in the Calling Party IE or the CPND Indicator is set to “Presentation Denied” in the Display IE.

Calling Party Privacy Enhancement

The Calling Party Privacy Enhancement (CPPE) feature provides a route option to ignore the Calling Party Privacy Indicator on incoming calls received from the North American public ISDN network.

When the Privacy Indicator Ignore (PII) prompt is set to YES in Overlay 16, the Calling Line Identification (CLID) Presentation Indicator and the Calling Party Name Display (CPND) Indicator (if it exists) are changed from restricted/denied to allowed.

If the CLID and CPND information is available, it is displayed on the terminating set, and the CLID is passed to the Auxiliary processor. It is recommended that the PII prompt be set to YES for 800, 888, 900, and 911 call types. When PII is set to NO (default) in Overlay 16, the Calling Party Privacy Indicator is honored, and the existing functionality is maintained.

The following parameters apply to the PII route option:

- The PII route option is applicable to the CLID Presentation Indicator in the Calling Number Information Element (IE) and the CPND Indicator in the Display IE in incoming SETUP messages only.
- The PII route option is not applicable to the CLID Presentation Indicator in the Redirecting Number IE of a SETUP message for call redirection.
- The PII route option is not applicable to the CLID Presentation Indicator in the Connected Number IE of a NOTIFY message for call modification.

The Calling Party Privacy Enhancement is included in Calling Party Privacy (CPP) package 301.

Operating parameters

The code to be dialed by the user can be flexibly defined, although *67 will be usual in North America. Multiple codes can be defined allowing a different code (e.g., 1167) to be used for rotary sets, across the Public Switched Telephone Network (PSTN) or Meridian Customer Defined Network (MCDN).

The code which is outpulsed on non-ISDN analog or digital trunks can also be flexibly defined on a per-route basis, for station sets for public and private network calls. Different codes can be programmed for routes which mix Digitone (DTN) and Dial Pulse (DIP) Classes of Service.

Frequently, the codes outpulsed on trunks will be the same as those dialed from station sets, but there is no reason why they cannot be different.

A non-ISDN trunk route will not be able to provision the CPP feature if Outpulsing of Asterisk and Octothorpe (OPAO) package 104 is equipped on the switch. During SYSLOAD, the CPP database will be removed from the non-ISDN trunk routes if the OPAO package is equipped.

The CPP feature is not supported on Digital Private Network Signaling System #1 (DPNSS1), Digital Access Signaling System #2 (DASS2) or R2 Multifrequency Compelled Signaling gateways.

Central Office Trunk (COT), Foreign Exchange (FEX), Wide Area Telephone Service (WATS), and Direct Inward Dialing (DID) are the only trunk route types allowed to outpulse the Privacy Indicator for an outgoing non-ISDN call.

ISDN implementations include DMS-100/250, SL-100, AT&T4, AT&T5, TR-1268 (NI-2) and Meridian Customer Defined Network (MCDN) private networks, QSIG, EuroISDN and Basic Rate Interface (BRI) trunks.

CPP is not formally supported on the International ISDN PRI connectivities, since CPP is primarily a North American feature. However, existing Calling Line Identification (CLID)/Calling Line Identification Restriction (CLIR) operations will continue to work.

The Privacy Indicator defined for a non-ISDN trunk route (dial pulse or digitone) consists of any arbitrary digit sequence (0-9) up to four digits in length. The asterisk “*” or octothorpe “#” is not allowed in the Privacy Indicator for an outgoing dial pulse trunk route. The asterisk is only allowed as the first digit of the Privacy Indicator (e.g., *67) for an outgoing digitone trunk route; the octothorpe is not allowed in any Privacy Indicator on an outgoing digitone trunk route.

If as user requests privacy by dialing the Flexible Feature Code (FFC) defined for the CPP feature, and CPP is not provisioned in the outgoing trunk route, the call will proceed without carrying the Privacy Indicator.

No Privacy Indicator is expected to be received from the Public Exchange/ Central Office on non-ISDN DID trunks. This would be treated as a misdial.

The CPP feature will not inhibit the Calling Party Number and Name from being displayed for an internal call within a local Meridian 1 customer group.

A common number defined for the Special Prefix (SPRE) code in the database is “1”. Thus, “1167” will not be accepted as an FFC for CPP due to the conflict with existing DNs. The technician should either change the SPRE code, or define a new FFC for CPP to be used by a rotary telephone.

Feature interactions

Autodial

An outgoing trunk call initiated by pressing the Autodial key will carry the Privacy Indicator if the Calling Party Privacy (CPP) code followed by the normal dialing sequence is stored against the Autodial key. The CPP code is counted against the maximum number of digits (currently 23) stored against the Autodial key.

A user can also store the CPP code against the Autodial key. An outgoing CPP call can be initiated by pressing the Autodial key, followed by manually dialing the digits.

An outgoing CPP call can also be initiated by dialing the CPP code, followed by pressing the Autodial key against which the normal dialing sequence of digits have been stored.

Automatic Call Distribution

A call placed by means of Enhanced Automatic Call Distribution (ACD) Routing, Enhanced Interflow, Enhanced Night Call Forward, Enhanced Network Routing, or Network ACD will respect the CPP request of the originator.

Automatic Call Distribution MAX (ACD MAX)

The Calling Line Identification (CLID) is still included in ACD MAX reports, even if the caller has requested CPP.

Automatic Redial

The calling party and called party have the same Calling Party Privacy considerations.

Call Detail Recording

The current Call Detail Recording (CDR) records which include the Calling Party Number will continue to do so even if the caller has requested CPP. The FFC for CPP dialed by the user will be included in the dialed digits field when generating a CDR record.

An outgoing non-ISDN trunk call outpulsing the Privacy Indicator will include the Privacy Indicator in the outpulsed digits field when generating the CDR records if the outgoing non-ISDN trunk route has Outpulsed Digit Option (DPD) activated.

Call Forward All Types
Hunt

If an incoming ISDN trunk call with the Privacy Indicator is forwarded, the Privacy Indicator will be tandemed to the far end to inhibit the display of the Calling Party Name or Number provided that the outgoing trunk route on the tandem node also has CPP provisioned.

If an incoming non-ISDN trunk call is forwarded to a trunk, the outgoing trunk call from the tandem node will carry the Privacy Indicator if the outgoing trunk route on the tandem node has the TCPP option set.

The CPP code can also be stored on the forwarding DN. If the CPP is requested on the forwarding DN, the Privacy Indicator will be outpulsed to the terminating node to inhibit the number of the forwarding set (i.e, at the tandem node) from being displayed on the terminating set. In this case, the forwarding station must include the CPP in the forwarding DN (such as *67 + ACOD + the DN on the terminating node).

The above scenario also applies to Hunt and Network Hunt.

Call Hold, Deluxe
Call Hold, Permanent

When a user takes an incoming trunk call with the Privacy Indicator off of hold, no Calling Party Number or Name will be displayed on the set.

Call Pickup

If an incoming trunk call with the Privacy Indicator is picked up locally, the display of the calling Party Number and Name are not displayed on the terminating set.

Call Pickup Network Wide

If an incoming trunk call with the Privacy Indicator is picked up by a remote set (requesting party), the display of the calling Party Number and Name are not displayed on the requesting set.

Call Party Name Display (CPND)

In current operations, if the International Supplementary Features (SUPP) package 131 is not equipped in the system, an incoming ISDN call with the Call Party Name Display (CPND) Indicator field set to “Presentation Denied” still displays the Calling Party Name. If package 131 is equipped in the system, the current operations will inhibit the Calling Party Name for an incoming ISDN call with the CPND Indicator field set to “Presentation Denied”.

The CPP feature will inhibit the display of the Calling Party Name for an incoming ISDN call with the CPND Indicator field set to “Presentation Denied” if package 131 is not equipped.

Call Transfer

If an incoming non-ISDN call is being transferred or an incoming ISDN call is transferred to a non-ISDN trunk, the Calling Party Name and Number will not be passed on to the terminating set. The CPP feature will not change this operation.

For cases where an incoming call with the Privacy Indicator is transferred over an MCDN trunk, or to a local station, the name and/or number of the originating party will not be displayed on the set of the final terminating party.

Calling Line Identification Restriction (CLIR)

The Flexible Feature Code is not supported on BRI sets. Calling Party Privacy can only be requested by setting the soft key “ID PRES” (if it exists) to “Denied” or the “PRES” prompt to “NO” in LD 27. If the Calling Party Number IE with the Presentation Indicator set to “Presentation Allowed” is included in the SETUP message generated by the BRI terminal, this BRI terminal will not allow Calling Party Privacy, as the Presentation Indicator generated by the BRI terminal always overwrites the CLIR service option.

Conference

The CPP feature will pass the Privacy Indicator to the terminating set to inhibit the display of the Calling Party Name and Number if the Conference feature is used for the purpose of performing a transfer.

Calling Party Name Display Denied

For outgoing calls, if the CPP package is equipped, the CPP feature will take precedence over the Calling Party Name Display Denied feature for restricting the Calling Party Name and Number. For example, if an outgoing ISDN call is marked as a CPP call, the outgoing SETUP message will include the Calling Party Number IE with the Presentation Indicator set to "Presentation Restricted" and the Display IE with the CPND Indicator set to "Presentation Denied", to inhibit both the Calling Party Number and Name being displayed on the terminating set, regardless of whether or not the Calling Party Name Display Denied feature allows the display of the Calling Party Name and/or Number.

The Calling Party Name Display Denied feature takes precedence over the CPP feature for displaying an incoming ISDN call. If International Supplementary Features (SUPP) package 131 is equipped, an incoming ISDN call with the Presentation Indicator set to "Presentation Restricted" in the Calling Party Number IE will be marked as a CPP call, and will display "ACOD + Member" or "XXXX" as for the Calling Party Name Display Denied feature.

Display Calling Party Denied

If the Calling Party Privacy (CPP) package is equipped, the CPP feature will take precedence over the Display Calling Party Denied (DPD) feature. The CPP feature also takes precedence over the DPD feature for displaying an incoming ISDN call if the CPP package is equipped. No "----" or "XXX" will be displayed, as for the DPD feature.

EuroISDN Trunk - Network Side

If a number presentation for a call is blocked by the Calling Party Privacy feature, the Calling Line ID, sent over a EuroISDN Trunk - Network Side connectivity, will have the presentation flagged as restricted.

Feature Group D

If an incoming Feature Group D (FGD) call terminates at a Meridian 1 switch locally, the received 10-digit Automatic Number Identification (ANI) will be displayed on the terminating set if the Show ANI Digits on Terminal Displays (SHAN) field is set to "YES" in the FGD data block associated with the incoming trunk route. If the originator requests CPP, the end office will not send the 10-digit ANI to the PBX.

If an incoming FGD call is routed to another switch via ISDN Primary Rate Interface (PRI) or Integrated Service Link (ISL), the outgoing SETUP message will include the 10-digit ANI (if it exists) as the Calling Party Number with the Presentation Indicator set to "Presentation Restricted" if the outgoing trunk route has the TCPP option on. The TCPP option takes precedence over the SHAN field defined in the FGD data block associated with the incoming trunk route to restrict the 10-digit ANI display.

Hot Line

A Hot Line call will carry the Privacy Indicator if the Calling Party Privacy (CPP) code followed by the normal dialing sequence is stored in the Hot Line DN. The CPP will count against the maximum number of digits (currently 31) allowed for the Hot Line DN.

Incoming Trunk Programmable CLID

If the incoming trunk route is a non-ISDN route, the billing number assigned by the incoming trunk route will be passed to the Public Exchange/Central Office with the Presentation Indicator field set to "Presentation Restricted" if the outgoing ISDN trunk route has the TCPP prompt set to "YES". If the TCPP prompt is set to "NO", the Presentation Indicator is set to "Presentation Restricted" only if the BDSP (Billing Display) prompt in the incoming trunk route is set to "NO".

If the incoming trunk route is an ISDN route, the "Restricted" Presentation Indicator will be tandemed to the outgoing trunk route. If the Presentation Indicator is set to "Presentation Allowed" or no Calling Party Number IE is received in the incoming trunk route, the billing number assigned by the incoming trunk route will be passed to the Public Exchange/Central Office with the Presentation Indicator field set to "Presentation Restricted" only if the incoming trunk route has the BDSP prompt set to "NO".

ISDN QSIG Name Display

Calling Party Privacy (CPP) takes precedence over the ISDN QSIG Name Display feature.

Last Number Redial

The Last Number Redial (LNR) feature will store the CPP code in the LNR data space if the CPP code was included in the last number dialed by the user. Any subsequent outgoing redialed call will send the Privacy Indicator to the far end.

Malicious Call Trace

Incoming calls to stations having the Malicious Call Trace feature enabled will continue to include the Terminal Number (TN) of the calling party in the Malicious Call Trace record, even if the caller has requested CPP.

Meridian Link

The CLID is still included in the Application Module Link (AML) messages sent to the Meridian Link Module even if the call has requested CPP.

Meridian Mail

When an incoming ISDN call with the Privacy Indicator terminates on Meridian Mail, the Calling Party Name and Number will not be passed to Meridian Mail to be recorded. When the called party retrieves the messages, no Calling Party Number of Name will be played, and the called party will not be able to initiate the Call Sender feature either, since no CLID is recorded.

Calls placed by means of Through Dial will be able to request privacy. These are calls where the person accessing Meridian Mail can dial 0 followed by any telephone number. The caller will be able to dial the CPP code as part of the number following 0.

Meridian MAX

The CLID is still sent to the Meridian MAX even if the caller has requested CPP.

Meridian 911

An incoming 911 call with ANI information will always display the ANI digits on the terminating set or pass the ANI information to the Meridian 911 application.

Network Message Services

An incoming trunk call with the Privacy Indicator will not display the Calling Party Name and Number on the Message Center operator's terminal.

Network Ring Again

A call placed by means of the Network Ring Again feature will respect the CPP requested when the call was originally dialed.

Private Line Service

The Private Line Service feature will outpulse the Privacy Indicator only if it is dialed by the originator. An asterisk will be outpulsed to the far end only if it is an OPAO call, otherwise the asterisk signals a three-second pause.

R2MFC CNI/CDR Enhancements

If the Calling Line ID is received with presentation denied, it is not mapped to the Call Number Information (CNI). Instead, the CNI is composed of the CNI DN and the Trunk ID. Optionally, the CNI request may set to ECNI (the CNI End-of-CNI R2MFC level 1 forward signal).

Ring Again – Busy Trunk

A call automatically redialed by the Ring Again – Busy Trunk feature will respect the CPP requested when the call was originally dialed.

Speed Call
System Speed Call

An outgoing trunk call initiated by dialing the Speed Call code will carry the Privacy Indicator if the CPP code followed by the normal dialing sequence is stored in the Speed Call Entry represented by the Speed Call code. The CPP code will be counted against the maximum number of digits (currently 31) allowed per Speed Call list entry.

A user can also store the CPP code in the Speed Call Entry (or Speed Call key). An outgoing CPP call can then be initiated by dialing the Speed Call code (or pressing the Speed Call key), followed by manually dialing the digits. However, existing Speed Call limitations do not allow a user to dial *67 (or anything else) before accessing a Speed Call list entry.

Stored Number Redial

During Stored Number Redial (SNR) programming, a user can store the CPP code followed by the normal dialing sequence in the SNR data space. Outgoing calls originated by the SNR feature will send the Privacy Indicator to the far end. The CPP code will be counted against the maximum number of digits (currently 31) allowed by the SNR feature.

During an active call on a Meridian 1 proprietary telephone, the Stored Number Redial feature will store the CPP code in the SNR data space if the CPP code was included in the number dialed by the originator. The outgoing redialed calls will send the Privacy Indicator to the far end.

Trunk Optimization Before Answer

An optimized call due to Trunk Optimization Before Answer will respect the CPP requested by the originator.

Feature packaging

The following packages are required for Calling Party Privacy:

- Calling Party Privacy (CPP) package 301, which is dependent on
  - — Flexible Feature Codes (FFC) package 139.

  Note: Non ISDN trunks must restrict the Outpulse Asterisk and Octothorpe (OPAO) package 104 to provide for the CPP feature.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 57 – Define the FFC for CPP feature. FFC package 139 is required for loading LD 57..

2 LD 16 – Define Privacy Indicators.

3 LD 10/11 – Activate Calling Party per-line blocking.

LD 57 – Define the FFC for CPP feature. FFC package 139 is required for loading LD 57.

Prompt	Response	Description
REQ	NEW CHG	Add, or change.
TYPE	FFC	Flexible Feature Code.
CUST	xx	Customer number.
FFCT	(NO) YES	Flexible Feature Confirmation Tone.
...		
CODE	CPP	FFC type to be altered. <CR> means that no FFC types are prompted.
...		
CPP	nnnn	Calling Party Privacy code. CPP is prompted only if the CPP package is equipped. Any arbitrary digit sequence up to four digits can be specified. For Meridian 1 proprietary set, an "*" can be entered as the first digit. A suggested value is *67. CPP will be prompted until a <CR> is entered.

LD 16 – Define Privacy Indicators.

CPP is only prompted if the CPP package is equipped, the OPAO package 104 is **not** equipped, the trunk outgoing (OGT) or incoming and outgoing (IAO), non-ISDN option and the trunk route type is COT, DID, FEX, or WAT.

Prompt	Response	Description
REQ	NEW CHG	Add, or change.
TYPE	RDB	Route Data Block.
CUST	xx	Customer number.

TKTP	COT DID FEX WAT	Central Office Trunk data block. Direct Inward Dialing trunk data block. Foreign Exchange trunk data block. Wide Area Telephone Service trunk data block.
...		
DTRK	YES	Digital trunk route.
DGTP	xx	Digital trunk type.
ISDN	YES	ISDN PRI option.
...		
ACOD	nnnn	Trunk Access Code.
CPP	YES	Calling Party Privacy. YES = This trunk route is enabled for the recognition of the Calling Party Privacy feature. CPP is only prompted if the following conditions are met: the CPP package is equipped, the OPAO package is not equipped, OGT (outgoing) or IAO (incoming and outgoing) trunk, non ISDN option and trunk route type is COT/DID/FEX/WAT. The default value for the CPP prompt is NO.
TCPP	(NO) YES	CPP for an incoming trunk call tandemed to this trunk route. YES = An incoming non-ISDN trunk call tandemed to this trunk route will carry the Privacy Indicator. The default value for the TCPP is NO.
- DTPI	(*67) nnnn	Privacy Indicator for a digitone trunk. DTPI is prompted only if CPP is set to “YES” and the trunk route is non-ISDN. If CPP is changed from NO to YES, the default is *67. Any arbitrary digit sequence (0-9) up to four digits can be specified. An asterisk “*” is allowed to be the first digit only if the outgoing call goes to a Public Network.

- DPPI	(1167) nnnn	Privacy Indicator for a dial pulse trunk. DPPI is prompted only if CPP is set to “YES” and the trunk route is non-ISDN. If CPP is changed from NO to YES, the default is 1167. Any arbitrary digit sequence (0-9) up to four digits can be specified.
- PII	(NO) YES	Calling Party Privacy Indicator is honored. Calling Party Privacy Indicator is ignored. ***Note:*** PII is only prompted when the CPP package is equipped; the trunk route type is COT, DID, FEX, or WAT; the ISDN option is set to YES; the ISDN Interface (IFC) is D100, D250, ESS4, ESS5, or NI2; and the route is Incoming and Outgoing (IAO) or Incoming Only Trunk (ICT). For further details on the PII route option, refer to the Calling Party Privacy Enhancement section on page 486.

LD 10/11 – Activate Calling Party per-line blocking.

CLBA Class of Service activates Calling Party per-line blocking. CLBD Class of Service deactivates Calling Party per-line blocking; however, the user can still request Calling Party Privacy by dialing the CPP code.

Prompt	**Response**	**Description**
REQ:	NEW CHG	Add, or change.
TYPE:	nnnn	Type of telephone.
TN	l s c u	Terminal Number.
	c u	For Option 11C.
...		
CLS	CLBA	Activate Calling Party per-line blocking. Enter CLBD to deactivate Calling Party per-line blocking (default). ***Note:*** CLBA Class of Service activates Calling Party per-line blocking. CLBD Class of Service deactivates Calling Party per-line blocking; however, the user can still request Calling Party Privacy by dialing the CPP code.

Feature operation

Any outgoing call initiated from a set with Calling Party per-line blocking (CLBA) Class of Service will request Calling Party Privacy.

If the originating party has CLBD Class of Service, the Calling Party Privacy feature can only be activated on a per-call basis; if standard dialing procedures are used, no CPP is requested, and the call will proceed as usual. The user must do one of the following to request CPP:

1 Precede any dialing of a call with a new Flexible Feature Code defined for the CPP feature. This operates from all telephone types, except BRI sets.

2 The Flexible Feature Code is not supported on BRI sets; however, Calling Party Privacy can be requested by setting the softkey “ID PRES” (if it exists) to “Denied” state or the “PRES” prompt to “NO” in LD 27.

Note: If the Calling Party Number ID with the Presentation Indicator set to “Presentation Allowed” is included in the SETUP message generated by the BRI terminal, this BRI terminal will not allow Calling Party Privacy, as the Presentation Indicator generated by the BRI terminal always overwrites the CLIR service option.

Calling Party Privacy Override

Contents

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Regional material statement

The information presented in this section does not pertain to all market regions. Contact your system supplier or your Nortel Networks representative to verify support of this product in your area.

Feature description

Calling Party Privacy Override (CPPO) enhances the functionality of the Calling Party Privacy (CPP) feature. With Calling Party Privacy Override, calling party information can be selectively unblocked on a per-call basis.

The Calling Party Privacy (CPP) feature enables the Meridian 1 system to permanently block the Calling Party Number and Name from being displayed on the terminating set across the Public Switched Telephone Network (PSTN). This permanent blocking occurs when Class of Service is set to Calling Party Number and Name per-line blocking allowed (CLBA).

When Class of Service is set to Calling Party Number and Name per-line blocking denied (CLBD), the user can block the Calling Party Number and Name on a per-call basis. To block the calling party information on a per call basis, the user dials a Calling Party Privacy Flexible Feature Code (FFC) prior to dialing the destination number.

With the Calling Party Privacy Override feature, a Private Branch Exchange (PBX) user can selectively unblock calling party information on a per-call basis when Class of Service is set to CLBA. The user unblocks the calling party information by dialing a Calling Party Privacy Override Flexible Feature Code prior to dialing the destination number.

When the CPPO Flexible Feature Code is dialed before the destination number, the user's calling party information is displayed on the terminating set. The default for the Calling Party Privacy Override Flexible Feature Code is "*82" for Meridian 1 proprietary sets and "1182" for analog (500/2500 type) sets. The Calling Party Privacy Override Flexible Feature Code is defined in Overlay 57.

CPPO is provisioned on a trunk route basis. Any trunk type that can support an outgoing call can request the CPPO feature.

> ***Note:*** For non-ISDN trunks, only Central Office Trunk (COT), Direct Inward Dial (DID), Foreign Exchange (FEX), and Wide Area Telephone (WATS) trunks are supported. However, all ISDN trunk routes support the CPPO feature.

When the CPPO Flexible Feature Code is dialed prior to the normal dialing sequence, the call is marked as a CPPO call. The CPPO Flexible Feature Code is then removed from the dialed digits stored in the call register. If the outgoing trunk route provisions CPPO, then the Privacy Override Indicator is sent to the far end, and the Calling Party Number and Name information is displayed on the receiving telephone. If the outgoing trunk route does not provision CPPO, the call does not carry the Privacy Override Indicator.

The following example illustrates Calling Party Privacy Override functionality:

1 Set A, a Meridian 1 proprietary set with Class of Service set to CLBA, goes off-hook.

2 Set A dials the Calling Party Privacy Override Flexible Feature Code, defined in Overlay 57. Calling Party Privacy Override is initiated.

3 Set A dials the destination number for Set B.

4 The call rings on Set B.

5 The calling party information of Set A is presented on the display screen of Set B.

Outgoing calls

For an outgoing non-ISDN trunk call, the Privacy Override Indicator is defined on the outgoing trunk route. The CPPO Flexible Feature Code is outpulsed to the far end provided that the outgoing trunk route provisions CPPO. If CPPO is not provisioned on the trunk route, then the call does not carry the Privacy Override Indicator.

For an outgoing ISDN call from one Meridian 1 to another, the Privacy Override Indicator is represented when the Presentation Indicator field is set to “Presentation Allowed” in the Calling Party Number Information Element (IE) and the Call Party Name Display (CPND) Indicator field is set to “Presentation Allowed” in the Display IE.

For an outgoing ISDN call to the Central Office, the Privacy Override Indicator is represented when the Presentation Indicator field is set to “Presentation Allowed” in the Calling Party Number IE and when the CPND information is included in the Display IE.

Incoming calls

An incoming ISDN call is recognized as a CPPO call (that is, it carries the Privacy Override Indicator) if the Presentation Indicator field is set to “Presentation Allowed” in the Calling Party Number IE and if the CPND Indicator is set to “Presentation Allowed” in the Display IE (if it exists).

. Call Party Name Display (CPND) information is optional for ISDN calls.

When an incoming call is on a non-ISDN route, the Meridian 1 does not receive the Privacy Override Indicator.

Tandem Calls

Incoming ISDN calls

ISDN to ISDN tandem

For an incoming call tandeming through the Meridian 1, any incoming Privacy Override Indicator is only repeated to the outgoing trunk route that also has CPPO provisioned.

When an incoming ISDN trunk call is tandemed through an ISDN trunk to a Meridian 1 switch, the Presentation Indicator or the CPND Indicator, received from the incoming ISDN trunk, is tandemed to the outgoing ISDN trunk.

When an incoming ISDN trunk call is tandemed through an ISDN trunk to a CO, the Presentation Indicator received from the incoming ISDN trunk is tandemed to the outgoing ISDN trunk. If the Display IE with the CPND Indicator set to “Presentation Allowed” is received from an incoming ISDN trunk, the Display IE, containing the Call Party Name, is sent across in the SETUP message tandemed to the outgoing ISDN trunk.

ISDN to non-ISDN tandem

When an incoming ISDN trunk call is tandemed to a non-ISDN trunk, the incoming call is treated as a CPPO call only if both the CLID and CPND Indicators are set to “Allowed”. Otherwise, the call is treated as a CPP call.

Incoming non-ISDN calls

For incoming non-ISDN calls, the Meridian 1 does not receive the Privacy Override Indicator.

When a call on an incoming non-ISDN route is tandemed on the Meridian 1, the call is tandemed based on how the CPP flag (TCPP) prompt is defined in the Route Data Block for the outgoing route.

When TCPP is set to YES, an incoming non-ISDN call tandemed to this route is treated as a CPP call.

When TCPP is set to NO, an incoming non-ISDN call tandemed to this route is treated as a CPPO call.

Non-ISDN to ISDN tandem

Even though a Privacy Override Indicator is not provided for an incoming non-ISDN trunk call, if the outgoing route has TCPP set to NO, the Presentation Indicator field in the Calling Party IE is set to “Presentation Allowed”.

Non-ISDN to non-ISDN tandem

A Privacy Override Indicator is not provided for an incoming non-ISDN trunk call. If the outgoing route has TCPP set to NO, the Privacy Override Indicator defined for that route is outpulsed, provided that the outgoing route provisions CPPO.

Operating parameters

Central Office Trunks (COT), Foreign Exchange (FEX), Wide Area Telephone Service (WATS), and Direct Inward Dial (DID) are the only trunk route types (including ISA service routes) that can outpulse the Privacy Override Indicator for an outgoing non-ISDN call. All ISDN trunk routes provision the CPPO feature.

A non-ISDN trunk route does not provision the CPPO feature if the Outpulse Asterisk and Octothorpe (OPAO) package (package 104) is configured. During SYSLOAD, the CPPO database is removed from the non-ISDN trunk routes if the OPAO package is configured.

The Privacy Override Indicator, defined for a non-ISDN trunk route (dial-pulse or digitone), consists of any four arbitrary digits from 0-9. The asterisk (*) or octothorpe (#) cannot be part of the Privacy Override Indicator for dial-pulse trunks. For digitone trunks, the asterisk (*) can only be the first digit of the Privacy Override Indicator Flexible Feature Code.

The asterisk and octothorpe are not outpulsed if the OPAO package is configured. The asterisk signals a 3-second pause and the octothorpe indicates end-of-dialing. The octothorpe cannot be used in a Privacy Override Indicator.

Privacy Override Indicators are not received from the CO or non-ISDN DID trunks.

The CPPO Flexible Feature Code cannot conflict with any internal DN, including the Special Prefix (SPRE) code.

When a user dials the Flexible Feature Code defined for the CPPO feature and if CPPO is not provisioned on the outgoing trunk route, the call proceeds without carrying the Privacy Override Indicator.

The CPPO feature does not affect whether or not the Calling Party Number and Name information is displayed for internal calls within the Meridian 1 system, even if the originator requests CPPO.

All incoming non-ISDN calls with the Privacy Override Indicator terminate on the Meridian 1. If the Privacy Override Indicator is not defined in the Flexible Feature Code for CPPO, an overflow tone (unrecognized digits) is provided to the user.

If the Stored Number Redial (SNR)/Last Number Redial (LNR) feature is used by the originator of a CPPO call to store the dialed digits, the CPPO Flexible Feature Code is stored against the SNR/LNR database. If the user removes that CPPO Flexible Feature Code and then the SNR/LNR feature is used to re-initiate the call, overflow tone is returned to the user.

ISDN implementation for this feature includes DMS100/250, SL-100, AT&T4, AT&T5, TR-1268 (NI-2), Meridian Customer Defined Network (MCDN) Private Networks, EuroISDN, QSIG, and BRI trunks.

The CPPO feature is supported on the following International PRI (IPRI) connectivities: Ericsson AXE-10 CO Connectivity (Australia), Ericsson AXE10-CO Connectivity (Sweden), French Numeris CO Connectivity, Japan D70 CO Connectivity, Swissnet 2 CO Connectivity, SYS-12 CO Connectivity, 1TR6 CO Connectivity (Germany), and Asia Pacific ISDN Phase 2.

The CPPO feature supports the following North American connectivities: DMS100/250, S1100, Lucent #4 ESS (ESS4), Lucent #5 EES (ESS5), and TR-1268 (NI-2).

CPPO does not support R2MFC signaling.

Feature interactions

Attendant Consoles

A CPPO call can be originated from any Meridian 1 Attendant Console. Attendant Consoles request CPPO by preceding the normal dialing sequence with the Flexible Feature Code for CPPO.

Attendant Consoles can also initiate a CPPO call using the Autoline key. An outgoing trunk call, initiated by pressing the Autoline key, carries the Privacy Override Indicator if the CPPO Flexible Feature Code, followed by the normal dialing sequence, is stored against the Autoline key. The CPPO Flexible Feature Code is counted against the maximum number of digits (currently 31) stored against the Autoline key.

The CPPO Flexible Feature Code can also be stored against the Autoline key. An outgoing CPPO call can then be initiated by pressing the Autoline key followed by manually dialing the destination number.

An outgoing CPPO call can also be initiated by dialing the CPPO Flexible Feature Code followed by pressing the Autoline key, on which the normal dialing sequence of digits for the destination number is stored.

Autodial

An outgoing trunk call, initiated by pressing the Autodial key, carries the Privacy Override Indicator if the CPPO Flexible Feature Code followed by the normal dialing sequence is stored against the Autodial key. The CPPO Flexible Feature Code is counted against the maximum number of digits (currently 31) stored against the Autodial key.

The CPPO Flexible Feature Code can be stored against the Autodial key. In this case, an outgoing CPPO call can be initiated by pressing the Autodial key followed by manually dialing the normal sequence of digits for the destination number.

An outgoing CPPO call can also be initiated by dialing the CPPO Flexible Feature Code followed by pressing the Autodial key on which the normal dialing sequence of digits for the destination number is stored.

Automatic Call Distribution

Calls placed by means of Enhanced Automatic Call Distribution (ACD) Routing, Enhanced Interflow, Enhanced Night Call Forward, Enhanced Network Routing, and Network ACD recognize the originator's CPPO request.

Automatic Call Distribution MAX

If the CPP package is equipped, ACD MAX reports include the Calling Line Identification (CLID) for incoming ISDN calls that have the CLID Presentation Indicator set to "Allowed".

Basic Rate Interface

Although Basic Rate Interface (BRI) networking is not supported in North America, CPPO treats BRI trunk calls in the same manner as an ISDN trunk call.

Call Detail Recording

Call Detail Recording (CDR) records continue to include the Calling Party Number even if the caller has requested CPPO. When the CDR record is generated, the CPPO Flexible Feature Code dialed by the originator is included in the DIGIT field (if it displays the dialed digits).

The CPPO Flexible Feature Code dialed by the originator is not included in the DIGIT field if it displays the outpulsed digits. The Privacy Override Indicator, outpulsed by an outgoing non-ISDN trunk route that provisions CPPO, is included in the outpulsed digits.

Call Pickup Network Wide

When an incoming trunk call with the Privacy Override Indicator is picked up by a remote set (the requesting party), the Calling Party Number and Name is displayed on the requesting set.

Call Hold

When an incoming trunk call with the Privacy Override Indicator is taken off hold, the Calling Party Number and Name information is displayed on the set.

Call Forward All Types
Hunt
Network Hunt

The existing call redirection functionality is not changed by this feature.

When an incoming ISDN trunk call with the Privacy Override Indicator is forwarded into the public or private networks, the Privacy Override Indicator is tandemed to the far end to allow the display of the Calling Party Number and Name, provided that the outgoing trunk route on the tandem node has CPPO provisioned.

When an incoming ISDN call with Calling Party Number and Name set to "Presentation Allowed" is forwarded to a set within the same node, the Calling Party Number and Name is displayed on the terminating set.

When an incoming non-ISDN trunk call is forwarded onto a trunk (where the Privacey Override Indicator is not expected) , the outgoing trunk call from the tandem node carries the Privacy Override Indicator, provided that the outgoing trunk route on the tandem node has CPPO provisioned. Also, the TCPP prompt in the Route Data Block must be set to NO.

The CPPO Flexible Feature Code can be stored on the forwarding Directory Number (DN), including the forwarding DN for Call Forward All Calls, Hunt DN and Flexible Call Forward No Answer DN (FDN).

If CPPO is requested on the forwarding DN and the call is forwarded across an ISDN link, the outgoing SETUP message includes the Redirecting Number IE (if it exists) with the Presentation Indicator set to "Presentation Allowed".

If CPPO is requested on the forwarding DN and the call is forwarded across a non-ISDN link, no Privacy Override Indicator is outpulsed to the terminating node if the originating set did not request CPPO. This is because no Redirecting Number information is sent across a non-ISDN link.

When an internal call is forwarded into the public or private networks, if the originator requests CPPO and the outgoing trunk route provisions CPPO, the Privacy Override Indicator is sent to the far end to allow the display of the Calling Party Number and Name.

Call Pickup

With CPPO activated, when an incoming trunk call with the Privacy Override Indicator is picked up locally, the Calling Party Number and Name information is displayed on the terminating set.

Call Transfer

As per existing operation, if an incoming non-ISDN call is transferred or an incoming ISDN call is transferred to a non-ISDN trunk, the Connect Party Number and Name information is not passed to the terminating node. The CPPO feature does not change this operation.

When an incoming call with the Privacy Override Indicator is transferred across the MCDN network or to a local set, the originator's calling party information is displayed on the final terminating set.

Calling Line Identification Restriction

Basic Rate Interface (BRI) sets do not support the Flexible Feature Code (FFC) feature. CPPO can only be requested by applying the existing Calling Line Identification Restriction (CLIR) Service option. This is done by setting the soft key "ID PRES" (if it exists) to "Allowed" or the Presentation of CLID to far end on outgoing calls (PRES) prompt to YES in Overlay 27. Then an outgoing ISDN/non-ISDN trunk call carries the Privacy Override Indicator if the outgoing trunk route provisions CPPO. However, if the Calling Party Number Information Element (IE) with the Presentation Indicator set to "Presentation Denied" is included in the SETUP message generated by the Basic Rate Interface (BRI) terminal, then the BRI terminal does not allow CPPO. This is because the Presentation Indicator, generated by the BRI terminal, always overwrites the Calling Line Identification Restriction (CLIR) service option.

Calling Party Privacy

If the user requests both Calling Party Privacy and Calling Party Privacy Override, then the feature last requested takes precedence. The Flexible Feature Code dialed last determines the type of call.

If a set with Class of Service set to CLBA requests CPPO by dialing the CPPO Flexible Feature Code, then the call is treated as a CPPO call. If a set with Class of Service set to CLBD requests CPP by dialing the CPP Flexible Feature Code, then the call is treated as a CPP call.

If a user dials the Flexible Feature Code for CPPO followed by the Flexible Feature Code for CPP, then the call is treated as a CPP call. If a user dials the Flexible Feature Code for CPP followed by the Flexible Feature Code for CPPO, then the call is treated as a CPPO call.

Calling Party Privacy and Call Forward

Set A, requesting CPPO, calls Set B. Set B Call Forwards All Calls to Set C. The CPP Flexible Feature Code is part of the forwarding DN. Set A's number and name is displayed on Set C as the Calling Party Number and Name; although, no redirecting number is displayed on Set C. The tandem node sends the Display IE with the Presentation Indicator set to "Allowed" and the Redirecting Number IE with the Presentation Indicator set to "Restricted".

Set A, requesting CPP, calls Set B. Set B Call Forwards All Calls to Set C. The CPPO Flexible Feature Code is part of the forwarding DN. Set B's number is displayed on Set C as the Redirecting Number; although, no Calling Party Number and Name is displayed on Set C. The tandem node sends the display IE with the Presentation Indicator set to "Restricted" and the Redirecting Number IE with the Presentation Indicator set to "Allowed".

Calling Party Privacy and Call Transfer

Set A, requesting CPPO, calls Set B. Set B answers the call, requests CPP, and initiates a transfer to Set D. After the transfer is complete, Set A's Calling Party Number and Name is displayed on Set D. The request made by the connected party takes precedence over the transferring party while displaying the Connect Party Number and Name.

Set A, requesting CPP, calls Set B. Set B answers the call, requests CPPO, and initiates a transfer to Set D. After the transfer is complete, Set A's Calling Party Number and Name is not displayed on Set D. The request made by the connected party takes precedence over the transferring party while displaying the Connect Party Number and Name.

Conference

The CPPO feature passes the Privacy Override Indicator to the terminating set in order to display the Calling Party Number and Name, if the Conference feature is used for the purpose of performing a transfer.

Display of Calling Party Denied

When the CPP package is equipped, the CPPO feature takes precedence over the Display of Calling Party Denied (DPD) feature for allowing the Calling Party Number and Name to be displayed. For example, when an outgoing ISDN call is marked as a CPPO call, then the outgoing SETUP message includes the Calling Party Number IE with the Presentation Indicator set to "Presentation Allowed" and the Display IE with the CPND Indicator set to "Presentation Allowed". This enables both the Calling Party Number and Name to be displayed on the terminating set, regardless of whether the DPD feature allows or denies the display of the Calling Party Number and/or Name.

E.164 ESN Numbering Plan Enhancement

CPPO can be requested for ESN calls by preceding the dialing sequence with the Flexible Feature Code defined for the CPPO feature. The CPPO Flexible Feature Code is counted against the maximum number of digits (currently 31) allowed for the destination DN.

Feature Group D

When an incoming Feature Group D (FGD) call terminates at a Meridian 1 switch locally, the received 10-digit Automatic Number Identification (ANI) is displayed on the terminating set if the Show ANI Digits on Terminal Displays (SHAN) field is set to YES in the FGD data block that is associated with the incoming trunk route. If the originator requests CPPO, the end office sends the 10-digit ANI to the PBX.

If an incoming FGD call is routed to another switch via ISDN Primary Rate Interface (PRI) or ISDN Signaling Link (ISL), the outgoing SETUP message includes the 10-digit ANI (if it exists) as the Calling Party Number (CLID) with the Presentation Indicator set to "Presentation Allowed". This occurs if the incoming call requests CPPO. CPPO takes precedence over the SHAN field that is defined in the FGD data block and is associated with the incoming trunk route to allow the 10-digit ANI display.

Hot Line

Hot line calls carry the Privacy Override Indicator if the CPPO Flexible Feature Code followed by the normal dialing sequence is stored in the Hot Line DN. The CPPO Flexible Feature Code is counted against the maximum number of digits (currently 31) allowed for the Hot Line DN.

Last Number Redial

The Last Number Redial (LNR) feature stores the CPPO Flexible Feature Code in the LNR database if the CPPO Flexible Feature Code was included in the last number dialed by the user. The outgoing redialed calls also send the Privacy Override Indicator to the far end.

Incoming Trunk Programmable Calling Line Identification

When the incoming trunk route is a non-ISDN route, the billing number (CLID) assigned by the incoming trunk route is passed to the CO with the Presentation Indicator field set to "Presentation Allowed", if the outgoing ISDN trunk route has the TCPP prompt set to NO.

When the incoming trunk route is an ISDN route, the "Allowed" Presentation Indicator is tandemed to the outgoing trunk route. If the Presentation Indicator is set to "Presentation Allowed" or no Calling Party Number IE is received on the incoming trunk route, the billing number assigned by the incoming trunk route is passed to the CO with the Presentation Indicator field set to "Presentation Allowed", if the incoming trunk route has the Billing Number Display (BDSP) prompt set to YES or NO.

ISDN Signaling Link

CPPO treats an ISDN Signaling Link (ISL) call in the same manner as an ISDN trunk call.

Malicious Call Trace

An incoming call to a set with the Malicious Call Trace (MCT) feature activated includes the Terminal Number (TN) of the calling party in the MCT record, whether or not the caller has requested CPPO.

Meridian 911

An incoming 911 call with Automatic Number Identification (ANI) information always displays the ANI digits on the terminating set or passes the ANI information to the Meridian 911.

Meridian Interactive Voice Response

An incoming ISDN call with the CLID Presentation Indicator set to "Allowed" sends the CLID to the Meridian Interactive Voice Response (IVR) if the CPP package is equipped.

Meridian Link

If the CPP package is equipped, an incoming ISDN call with the CLID Presentation Indicator set to "Allowed" includes the CLID in the Application Module Link (AML) messages sent to the Meridian Link module.

Meridian Mail

When an incoming ISDN call with the CLID Presentation Indicator set to "Allowed" terminates on Meridian Mail, the CLID passed to Meridian Mail is recorded. The call is treated by Meridian Mail as an external call.

Calls placed by means of Through Dial can request Calling Party Privacy Override. These calls involve the person accessing Meridian Mail (mailbox user or incoming caller) dialing 0 followed by any telephone number. The caller is able to dial a CPPO Flexible Feature Code plus the normal dialing sequence, following the 0. The asterisk (*) or octothorpe (#), as part of the CPPO Flexible Feature Code, are rejected by Meridian Mail. Therefore, the CPPO Flexible Feature Code can only consist of seven digits (0-9).

Meridian MAX

If the CPP package is equipped, an incoming ISDN call with the CLID Presentation Indicator set to "Allowed" sends the CLID to Meridian MAX.

Network Call Redirection

If a set receives a call and is then redirected to the public network on an ISDN trunk that supports call redirection, then the redirecting IE in the outgoing SETUP message has the Presentation Indicator set accordingly. For instance, if the call that had requested CPPO is redirected, the outgoing SETUP message has the Presentation Indicator set to "Allowed".

Network Message Center

An incoming trunk call with the Privacy Override Indicator displays the Calling Party Number and Name on the Message Center operator's terminal.

Network Ring Again

A call placed by means of the Network Ring Again feature recognizes the CPPO request from when the call was originally dialed.

Nortel Networks Symposium Call Center

As per existing operation, an incoming CPPO call routed to Nortel Networks Symposium Call Center contains the CLID.

Private Line Service

The Private Line Service feature outpulses the Privacy Override Indicator only if it is dialed by the originator. The asterisk (*) is outpulsed to the far end only if it is an Outpulse Asterisk and Octothorpe (OPAO) call. Otherwise, the asterisk (*) signals a three-second pause.

Remote Virtual Queuing

The Remote Virtual Queuing feature has automatic re-try capabilities that are used when congestion is encountered within the network. The same Calling Party Privacy Override considerations are provided to the “re-tries” as were provided to the originally dialed call.

Ring Again – Busy Trunk

A call that is automatically redialed by the Ring Again - Busy Trunk feature recognizes the CPPO requested when the call is originally dialed.

Speed Call
System Speed Call

When an outgoing trunk call is initiated by dialing a Speed Call code, the Speed Call code carries the Privacy Override Indicator if the CPPO Flexible Feature Code followed by the normal dialing sequence is stored in the Speed Call Entry represented by the Speed Call code. The CPPO Flexible Feature Code is counted against the maximum number of digits (currently 31) allowed per Speed Call list entry.

The user can also store the CPPO Flexible Feature Code in the Speed Call Entry (or Speed Call key). An outgoing CPPO call can be initiated by dialing the Speed Call code (or pressing the Speed Call key), followed by manually dialing the digits.

Stored Number Redial

In the Stored Number Redial (SNR) programming mode, the user can store the CPPO Flexible Feature Code, followed by the normal dialing sequence in the SNR database. The outgoing calls originated by the Stored Number Redial feature send the Privacy Override Indicator to the far end. The CPPO Flexible Feature Code is counted against the maximum number of digits (currently 31) allowed by the SNR feature.

During an active call on a Meridian 1 proprietary set, the Stored Number Redial feature stores the CPPO Flexible Feature Code in the SNR database if the CPPO Flexible Feature Code is included in the number dialed by the originator. The outgoing redialed calls also send the Privacy Override Indicator to the far end.

Trunk Anti-Tromboning

When trunks are removed, due to the Trunk Anti-Tromboning (TAT) operation, an ISDN call recognizes the CPPO/CPP requested by the originator.

Trunk Optimization Before Answer

An optimized call, due to Trunk Optimization Before Answer (TRO) operation, recognizes the CPPO/CPP requested by the originator.

Virtual Network Services

CPPO treats Virtual Network Services (VNS) trunk calls in the same manner as ISDN trunk calls. For instance, CPPO does not affect the existing VNS operation. If CPPO was requested when originating a call, the Presentation Indicator field of CLID is set to “Presentation Allowed”.

VISIT

The VISIT which connects to a set receives the Calling Party Number or Name, since an incoming CPPO call sends the Calling Party Number or Name to the set for display.

Feature packaging

The Calling Party Privacy Override feature requires the following package:

- Calling Party Privacy (CPP) package 301, which has the following dependency:
  - — Flexible Feature Codes (FFC) package 139.

For Calling Party Name Display, Calling Party Name Display (CPND) package 95 is required. ISDN package 145 is required for ISDN routes.

> ***Note:*** Non-ISDN trunks must restrict the Outpulse Asterisk and Octothorpe (OPAO) package 104 to provision the Calling Party Privacy Override feature.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 16 – Configure Privacy Override Indicators for a Non-ISDN route.

2 LD 16 – Set the TCPP flag in RDB to tandem non-ISDN calls on an ISDN trunk route.

3 LD 57 – Define the Flexible Feature Code for the Calling Party Privacy Override feature.

4 LD 10/11 – Activate Calling Party Number and Name per-line blocking.

LD 16 – Configure Privacy Override Indicators for a Non-ISDN route.

Configuration procedures require that the following conditions are met:

- CPPO is configurable on COT, DID, FEX, WAT and ISA routes.
- OAPO package 104 is restricted or unequipped.
- Route is either OGT (outgoing) or IAO (incoming and outgoing).

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	RDB	Route Data Block.
CUST	xx	Customer number as defined in LD 15.
ROUT	xxx	Route number. xxx = 0-511 for Options 51C, 61C, and 81C. xxx = 0-127 for Option 11C.
...		
CPP	YES	Calling Party Privacy/Privacy Override (CPP/CPPO) flag. Enable CPP/CPPO feature and configure parameters. (NO) = CPP/CPPO feature is disabled is the default.

- TCPP	 (NO) YES	CPP/CPPO flag treatment for an incoming non-ISDN trunk call tandemed to this trunk route. Outgoing call will carry the Privacy Override Indicator (default). Outgoing call will carry the Privacy Indicator.
- DTPI	(*67) nnnn	Digitone Trunk Privacy Indicator nnnn = 0-9999, an asterisk (*) can be entered as the first digit.
- DPPI	0-(1167)-9999	Dial-pulse Trunk Privacy Indicator
- DTPO	(*82) nnnn	Digitone Trunk Privacy Indicator nnnn = 0-9999, an asterisk (*) can be entered as the first digit.
- DPPO	0-(1182)-9999	Dial-pulse Trunk Privacy Indicator

LD 16 – Set the TCPP flag in RDB to tandem non-ISDN calls on an ISDN trunk route.

Configuration procedures require that the following conditions are met:

- The CPP package 301 is equipped.
- Route is either OGT (outgoing) or IAO (incoming and outgoing).

Prompt	**Response**	**Description**
REQ	CHG	Change existing data.
TYPE	RDB	Route Data Block.
CUST	xx	Customer number as defined in LD 15.
ROUT	xxx	Route number. xxx = 0-511 for Options 51C, 61C, and 81C. xxx = 0-127 for Option 11C. ***Note:*** All ISDN trunk routes are CPPO configurable.
...		
CPP	 YES	Calling Party Privacy/Privacy Override (CPP/CPPO) flag. Enable CPP/CPPO feature and configure parameters. (NO) = CPP/CPPO feature is disabled is the default.
- TCPP	 (NO) YES	CPP/CPPO flag treatment for an incoming non-ISDN trunk call tandemed to this trunk route. Outgoing call will carry the Privacy Override Indicator (default). Outgoing call will carry the Privacy Indicator.

LD 57 – Define the Flexible Feature Code for the Calling Party Privacy Override feature.

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	FFC	Flexible Feature Code.
CUST	xx	Customer number as defined in LD 15.
FFCT	(NO) YES	Flexible Feature Confirmation Tone denied. Flexible Feature Confirmation Tone allowed.
...		
CODE	CPP	CPP Flexible Feature Code
- CPP	xxxx	Calling Party Privacy code xxxx = 0-9999, an asterisk (*) can be entered as the first digit. The Flexible Feature Code may be up to 4 digits, or up to 7 digits with the Directory Number Expansion (DNXP) package (150).
- CPP	xxxx	Change the CPP code or enter a <CR> to accept.
CODE	CPPO	CPPO Flexible Feature Code
- CPPO	xxxx	Calling Party Privacy Override code xxxx = 0-9999, an asterisk (*) can be entered as the first digit. The Flexible Feature Code may be up to 4 digits, or up to 7 digits with the Directory Number Expansion (DNXP) package (150).
- CPPO	xxxx	Change the CPPO code or enter a <CR> to accept.

LD 10/11 – Activate Calling Party Number and Name per-line blocking.

Prompt	Response	Description
REQ:	NEW CHG	Add new data. Change existing data.
TYPE:	aaaa	Type of set.
TN	l s c u c u	Terminal Number. l = loop, s = shelf, c = card, u= unit for options 51C, 61C, and 81C. c = card, u = unit for option 11C.
DES	d...d	Designator The response d...d represents an Office Data Administration System (ODAS) Station Designator of 1-6 alphanumeric characters.
CUST	xx	Customer number as entered in LD 95.
...		
CLS	CLBA	Activate Calling Party Number and Name per-line blocking. CLBD = Deactivate Calling Party Number and Name per-line blocking (default).

Feature operation

For a user to override the Calling Party Number and Name per-line blocking allowed (CLBA) Class of Service, the following steps must be performed.

1 The user goes off hook.

2 The user initiates a call by dialing the Calling Party Privacy Override Flexible Feature Code, defined in LD 57.

3 The user dials the destination number.

———————— ***End of Procedure*** ————————

Channel Negotiation

Contents

The following are the topics in this section:

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Incoming calls 522
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Feature description

The Channel Negotiation feature operates on connections between the Meridian 1 and Central Offices conforming to the following protocols:

- AXE-10
- SYS-12
- 1TR6
- QSIG
- Japan D70 (INS NET-64)
- NEAX-61
- Numeris
- EuroISDN (in some countries)

Channel Negotiation allows call setup to continue even where a chosen bearer channel is unacceptable to the receiving switch. When this occurs, a search for an alternative channel acceptable to both ends of the call can take place.

On an incoming or an outgoing call, the SETUP message sent by the Central Office or the Meridian 1 respectively contains the number of the requested B-channel. The receiving side then sends a response to this SETUP message, also containing a B-channel number. Where the requested B-channel was acceptable to the receiving side, this number will be the same as the one sent in the SETUP message. If the requested channel was unavailable or unacceptable, a different, alternate B-channel number is given.

If Channel Negotiation is not enabled and the requested B-channel is either unavailable or unacceptable to the receiving switch, call clearing will take place. On an outgoing call, reorder tone will be presented to the Meridian 1 caller. (The exception to this occurs where the channel requested by the Meridian 1 does not exist at the Central Office; the Meridian 1 will search for another B-channel to use.)

Note: If channel negotiation is used on a PRI interface, the B-channels must not be shared between customers.

Outgoing calls

If Channel Negotiation has been enabled (by way of the CNEG prompt in overlay 17) and an alternate B-channel is received on an outgoing call, the Meridian 1 checks that B-channel's state. If the alternate B-channel is idle, the call proceeds on that channel. Should the alternate be unacceptable to the Meridian 1, a RELEASE signal is sent to the CO. The Meridian 1 searches for another idle B-channel and re-attempts the call.

Incoming calls

With Channel Negotiation enabled, the Meridian 1 will respond to an unacceptable B-channel request on an incoming call by looking for an alternative, acceptable B-channel (one also controlled by the D-channel controlling the channel requested by the CO). If it finds one, it sends the alternative B-channel number in its response to the CO's SETUP message. If the Meridian 1 cannot find another acceptable B-channel under the same D-channel, a RELEASE COMPLETE message is sent back to the CO, clearing the call.

Operating parameters

Channel negotiation cannot take place over ISDN PRI connections between Meridian 1 nodes.

Feature interactions

There are no feature interactions associated with this feature.

Feature packaging

This feature is included in base X11 System Software.

Feature implementation

There are no specific implementation procedures for this feature.

Feature operation

No specific operating procedures are required to use this feature.

D-Channel Expansion

Contents

The following are the topics in this section:

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Feature description

The D-Channel Expansion feature increases the total number of possible D-channels in a multiple group Meridian 1 system. The D-Channel Expansion feature increases the number of physical I/O addresses permitted for D-channel application to 16 for each network group. For each MSDL physical I/O address, up to four ports are available for D-channel use. With the D-Channel Expansion feature, the X11 software supports up to 255 D-channels.

Table 41 shows a summary of the physical I/O addresses permitted in a system.

Table 41
Maximum physical I/O addresses in an Option 81C system

Card Type	Application		
	TTY	AML	DCH Only
MSDL (NT6D80)	0-15 per system	0-15 per system	0-15 per group
DDCH (NTBK51AA)	Does not apply	Does not apply	0-15 per group
Non-MSDL DCH devices DCHI (QPC757)	Does not apply	Does not apply	0-15 per system
Any non-MSDL I/O device, such as SDI (QPC139)	0-15 per system	Does not apply	Does not apply

Operating parameters

Although all Meridian 1 systems support the D-Channel Expansion feature, it applies only to multiple group (Option 81C) systems. For single group systems, the maximum number of D-channels in the system remains at 64.

D-Channel Expansion allows physical I/O addresses, or device numbers (DNUM), to be duplicated in separate network groups. The duplicate DNUM must be a Multi-purpose Serial Data Link (MSDL) or Downloadable D-Channel Handler (DDCH) card with only D-Channel applications configured.

If a non-MSDL device uses a physical I/O address, then:

- this I/O address is available for use by DDCH cards, or MSDL cards running DCH applications only, in another group.
- this I/O address is no longer available for other non-MSDL cards, or MDSL cards running non-DCH applications.

If an MSDL card uses a physical I/O address, and a non-DCH application is configured one of it's ports, then:

- this I/O address is available for use by DDCH cards, or MSDL cards running DCH applications only, in another network group.
- this I/O address is no longer available for other non-MSDL cards, or MSDL cards running non-DCH applications.

If a DDCH card or an MSDL card, with only DCH applications configured, uses a physical I/O address, then:

- this I/O address is available for use by DDCH cards, or MSDL cards running DCH applications only, in another network group.
- this I/O address is also available for one other non-MSDL card, or an MSDL card running non-DCH applications, in one other network group.

Note: You cannot configure a duplicate physical I/O address within the same network group, regardless of the applications.

Table 42
Use of the same physical I/O address in a multi-group System

Device/application	MSDL (DCH only) DNUM x GROUP z	MSDL (non-DCH) DNUM x GROUP z	Non-MSDL DNUM x GROUP z
MSDL (DCH only) DNUM x GROUP z	valid	valid	valid ***Note:*** See "Adjacent Devices" on page 528.
MSDL (non-DCH) DNUM x GROUP z	valid	not valid	not valid
Non-MSDL DNUM x GROUP z	valid ***Note:*** See "Adjacent Devices" on page 528.	not valid	not valid
Where: — x = I/O device number — y = Group number — z = Alternate group number			

Adjacent Devices

Non-MSDL I/O devices can appropriate one or more pairs of physical device numbers. Switch settings on the hardware define the device numbers. The adjacent device is the second device number of the pair. Quad SDIs (QPC841, NT8D41BA) can have two separate pairs of adjacent device numbers.

When one device number of the pair is configured, the adjacent device number is reserved for the same device type. Therefore, both adjacent device numbers are considered used, even if only one is configured. This is consistent with existing operation. The adjacency rule can cause exceptions to Table 42.

For example, a system has an MSDL, non-DCH (any single port not configured as a DCH), configured as DNUM 4 in GROUP 0. The system also has an MSDL (DCH only) configured as DNUM 5 in GROUP 0. To configure DCHI (Non-MSDL) DNUM 5 in GROUP 1 is not valid. This design appears valid in Table 42 on page 528, however DCHI 5 has an adjacent DNUM 4, which is a non-MSDL. Because another device (MSDL non-DCH) uses DNUM 4, the operation is not valid.

Feature interactions

Incremental Software Management

The maximum number of D-Channels in a Meridian 1 system is one of the ISM limits in the system. The keycode file defines the ISM limits in an IODU/C based Meridian 1 system. The DCH limit is set in the keycode generation process. If the DCH limit is 64, the Keycode Generation group can change the DCH limit to a maximum of 255.

Network Capacity Expansion

The D-Channel expansion feature increases the number of physical I/O addresses for DCH to 16 per network group. The limit of physical I/O addresses in a Meridian 1 multiple group system depends on the number of groups in the system. The Network Capacity Expansion feature increases the maximum number of network groups allowed in a Meridian 1 system to eight.

Feature packaging

The D-Channel Expansion feature requires the following packages:

- Integrated Services Digital Network (ISDN) package 145
- Primary Rate Access (PRA) package 146
- ISDN Signaling Link (ISL) package 147
- 2.0 Mb/s Primary Rate Interface (PRI2) package 154
- Multi-purpose Serial Data Link (MSDL) package 222

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 17 – Define D-channels with D-channel Expansion feature.

LD 17 – Define D-channels with D-channel Expansion feature.

Prompt	Response	Description
REQ	CHG	Change existing data block.
TYPE	ADAN	All input/output devices (includes D-channels).
CUST	xx	Customer number.
ADAN	aaa bbb x	Action device and number. aaa = NEW, CHG, MOV, or OUT bbb = I/O device type x = port number (0-254)
CTYP	MSDL	Multi-purpose Serial Data Link card.
GRP	0-7	Network group number.
DNUM	0-15	Device number for I/O ports. ***Note:*** This limit applies to each group.
PORT	x	Port number. x = 0-3 for MSDL cards.
....	....	

Note: You can define a DDCH card as an MSDL card, but the card will have two D-channel ports instead of four.

Example of D-channel configuration in Overlay 17

Table 43 shows an example of how you can configure D-channels in Overlay 17. In this example, you can define a TTY device using I/O address 0 (device number) in group 0. You can also define an MSDL card using I/O address 0, but it must be in a different network group. You can define additional MSDL cards using the same I/O address, depending on the number of groups in the system.

Table 43
Example of D-channel configuration in Overlay 17 (Part 1 of 2)

Prompt	Response	Description
REQ	CHG	Change existing data block.
TYPE	ADAN	All input/output devices (includes D-channels).
CUST	xx	Customer number.
ADAN	NEW TTY 0	Define new TTY device on port 0.
CTYP	SDI	Single port SDI card.
GRP	0	Network group 0.
DNUM	0	Device number 0.
....	....	
ADAN	NEW DCH 100	Define new DCH device on port 100.
CTYP	MSDL	Multi-purpose Serial Data Link card.
GRP	1	Network group 1.
DNUM	0	Device number 0.
....	....	
ADAN	NEW DCH 200	Define new DCH device on port 200.
CTYP	MSDL	Multi-purpose Serial Data Link card.

Table 43
Example of D-channel configuration in Overlay 17 (Part 2 of 2)

GRP	2	Network group 2.
DNUM	0	Device number 0.
....	....	

Note: The MSDL cards must run DCH applications only.

Feature operation

No specific operating procedures are required to use this feature.

Data Packet Network access

Contents

The following are the topics in this section:

Feature description 533
Data Packet Network Access X.25 535
Operating parameters 535
Feature interactions 535
Feature packaging 535
Feature implementation 535
Feature operation 535

Feature description

PRI connections to DMS-100 allow Meridian 1 users to access Data Packet Networks (DPNs) connected to the central office. The steps involved are listed below. Equipment configuration is shown in Figure 49.

1 In coordination with DMS-100 maintenance personnel, a Meridian 1 DN associated with a High Speed Data Module (HSDM) is specified as the port for DPN access.

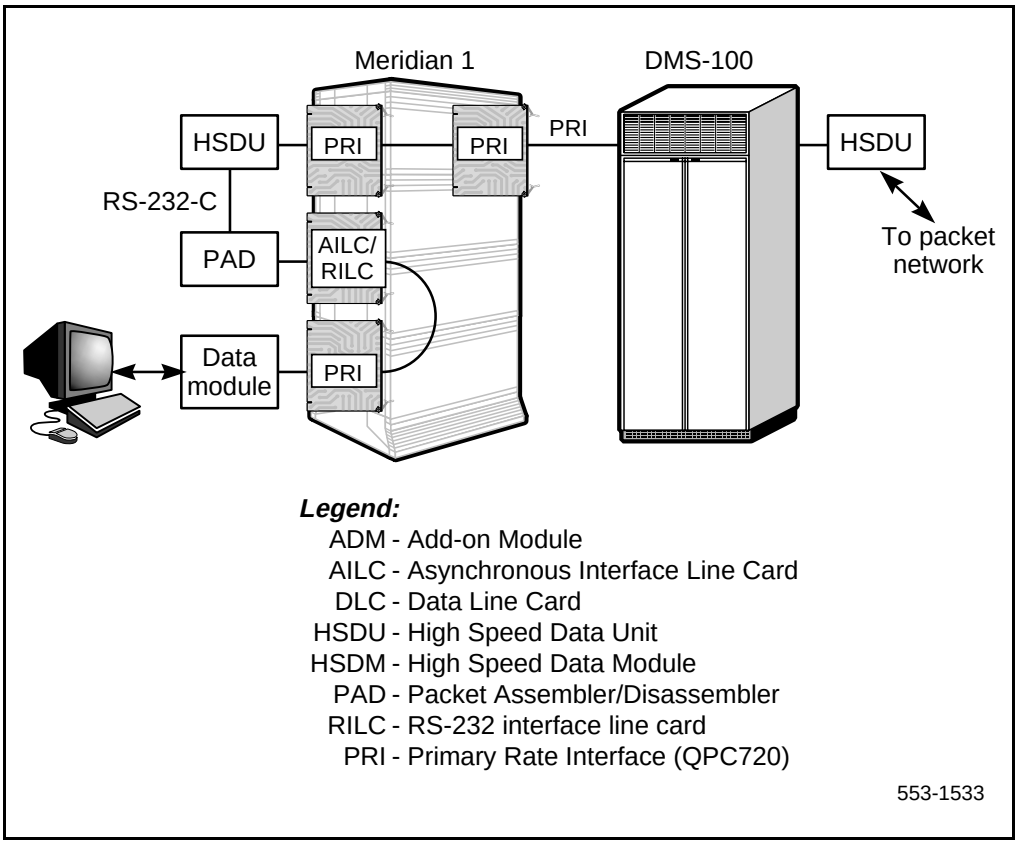
2 Meridian 1 software initiates a hot line call through the specified HSDM to a High Speed Data Unit (HSDU) connected to the DMS-100. The HSDU communicates with the Meridian 1 HSDM through the T-Link version 2 protocol. This requires the QPC720 PRI card.

3 Data is sent from the PRI through the B-channel. The call is set up using standard ISDN D-channel messaging.

4 The HSDU and HSDM go through T-Link protocol exchange.

5 The DN of a Packet Assembler/Disassembler (PAD) output port is associated with the HSDM. The Meridian 1 user accesses the Data Packet Network by dialing the DN of the PAD.

Figure 49
Meridian 1 PRI to DMS-100 Data Packet Network



Data Packet Network Access X.25

PRI trunks may be configured to access a Public Data Packet Network (DPN - X25) via the DMS-100 ISDN node, provided that this service is made available by the serving Central Office. On a per call basis, any B-channel can be used to access the packet network.

No high-speed data is currently available on Option 11C.

Operating parameters

There are no operating parameters associated with this feature.

Feature interactions

There are no feature interactions associated with this feature.

Feature packaging

This feature requires the following packages:

- Integrated Services Digital Network (ISDN) package 145;
- Primary Rate Interface (PRI2) package 146.

Feature implementation

There are no specific implementation procedures for this feature.

Feature operation

No specific operating procedures are required to use this feature.

DID-to-network Calling

Contents

The following are the topics in this section:

Feature description 537
Operating parameters 538
Feature interactions 538
Feature packaging 538
Feature implementation 538
Feature operation 538

Feature description

This feature facilitates Direct Inward Dialing into the private ISDN. The Direct Inward Dial (DID) call will be treated as though the entire ISDN is a large PBX.

DID calls entering the network at the local node (that is, the node on which the destination set resides) are unaffected by the feature's operation. In this case, treatment of the DID call is the same as with the stand-alone configuration. The DID-to-Network Calling feature affects only those DID calls which enter the network at a node other than the destination set's node.

Routing of the DID call across the ISDN will be the same as the routing of a network call originated from within the network. (An additional information element is sent with the call set-up message, to indicate that the network call originated from a DID trunk.)

A DID call which must be routed across the network will receive a treatment similar to that given to a call terminating within the local node. The DID call will receive intercept treatment, if the dialed DN is fully restricted or has DID-restricted Class of Service. (It will also receive intercept treatment if the DN is maintenance busy, vacant, or if routing failure/PABX congestion is encountered.)

Operating parameters

There are no operating parameters associated with this feature.

Feature interactions

There are no feature interactions associated with this feature.

Feature packaging

This feature is included in base X11 System Software.

Feature implementation

There are no specific implementation procedures for this feature.

Feature operation

No specific operating procedures are required to use this feature

Digit Key Signaling at Console

Contents

The following are the topics in this section:

Feature description 539
Operating parameters 540
Feature interactions 540
Feature packaging 541
Feature implementation 541
Feature operation 541

Feature description

This Digit Key Signaling enhancement provides attendants with a limited set of Meridian Mail functions at the console. It allows attendants to enter command digits during certain call states. These digits are sent to Meridian Mail over the ISDN/AP link.

These functions allow attendants to help callers operate the features offered by Meridian Mail (for instance, playing voice messages from an external rotary dial set).

The attendant can send keypad digits (0-9, * and #) under the following conditions:

- while extending source calls to Meridian Mail
- during direct calls to Meridian Mail

The digits are sent to Meridian Mail by way of ISDN/AP KEY messages (and not by way of End to End signaling). Dialed digits are not saved by the Meridian 1 and are not displayed at the Attendant Console.

While connected to Meridian Mail, other attendant functions continue to operate as before.

Extending source calls to Meridian Mail

When extending a source call to Meridian Mail, Digit Key signaling operates under the following conditions:

- a call is present on the SRC key of the active loop,
- a call is established on the DEST key to a Meridian Mail agent, and
- the DEST call to Meridian Mail is not a conference call

Once the attendant has reached Meridian Mail and entered the necessary digits to begin playback of messages, the SRC call can be extended to Meridian Mail to allow the caller to hear voice messages.

Direct calls to Meridian Mail

Digit Key signaling also operates when the attendant dials Meridian Mail directly, under the following conditions:

- no call is present on the DEST key of the active loop,
- a call is established on the SRC key to the Meridian Mail agent (CLS of VMA), and
- the SRC call to Meridian Mail is not a conference call

The attendant cannot extend the call to a destination party using dialed digits. (Key pad input is treated as Digit Key signaling and not as dialing digits.)

Operating parameters

There are no operating parameters associated with this feature.

Feature interactions

There are no feature interactions associated with this feature.

Feature packaging

The following packages are both required for Digit Key Signaling at Console:

- ISDN package 145; and
- Digit Key Signaling (DKS) package 180.

Feature implementation

There are no specific implementation procedures for this feature.

Feature operation

No specific operating procedures are required to use this feature.

Digital Trunk Interface and Primary Rate Interface Time Slot Reuse

Contents

The following are the topics in this section:

Feature description 543
Operating parameters 544
Feature interactions 544
Feature packaging 544
Feature implementation 544
Feature operation 544

Feature description

This feature eliminates call blocking due to unavailable time slots. This feature allows a time slot reserved for a primary function to be reused for any subsequent requirements during call processing. Therefore, all channels on Digital Trunk Interface (DTI) or Primary Rate Interface (PRI) loops are available for use.

Time slots reserved for a particular DTI or PRI channel are stored in an unprotected data structure allowing easy access, such as a call register. Each time a new path is required for the same DTI or PRI channel, the data structure can be accessed to determine if there is a reserved time slot that can be reused. If the new path is intra-group (single-group switch), the time slot can be reused. If the new path requirement is inter-group (multi-group switch), the reserved time slot can be reused if a matching junctor slot is available.

A count is kept of the number of times that a time slot has been reused. The time slot is not idled until all reservations have been canceled.

This feature applies to the following loop types on single-group switches:

- 1.5 Mb 24-channel DTI
- 2.0 Mb 30-channel DTI
- 1.5 Mb 23 B+D PRI
- 2 Mb 30 B+D PRI, and
- 2 Mb Japan Digital Multiplex Interface (DMI).

Operating parameters

This feature applies only to network enhanced machines.

Feature interactions

There are no interactions with other features.

Feature packaging

No packaging requirements are specified for this feature.

Feature implementation

No implementation procedures are required for this feature.

Feature operation

No specific operating procedures are required to use this feature.

Display of Access Prefix on CLID

Contents

The following are the topics in this section:

Feature description 545
Operating parameters 546
Feature interactions 546
Feature packaging 546
Feature implementation 546
Task summary list 546
Feature operation 550

Feature description

The Display of Access Prefix on Calling Line Identification (CLID) feature enhances the set display by adding the Local, National or International prefix to the CLID display.

The four digit access prefix is a combination of the access code and the National or International prefix. The access code defines the best outgoing route for an external call and the prefix code defines National or International calls. If the trunk requires the International prefix of two digits, the access code (ACOD) is a maximum of two digits.

The Access Prefix Display on CLID feature supports:

- Meridian 1 proprietary sets: M2008, M2216, M2016, and M2317
- Meridian 1 Attendant Consoles: M2250 and M1250

The Display of Access Prefix on CLID feature supports the following Integrated Services Digital Networks (ISDN) interfaces:

- Meridian Customer Defined Network (MCDN)
- Q-reference Signaling Point (QSIG)

Operating parameters

If CLID is not available, the trunk access code and the prefix number are displayed according to the existing feature operation.

The Display of Access Prefix on CLID feature supports the Coordinated Dialing Plan (CDP) or the Uniform Dialing Plan (UDP).

The Display of Access Prefix on CLID feature does not support analog (500/2500) sets, CLASS sets, or Integrated Services Digital Network (ISDN) Basic Rate Interface (BRI) sets.

Feature interactions

Selectable Conferee Display and Disconnect

The Selectable Conferee Display and Disconnect feature displays and allows the disconnect of conferenced sets.

Feature packaging

The Display of Access Prefix on CLID feature requires the Integrated Services Digital Network (ISDN) package 145.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 11 - Enable the Display of Access Prefix on CLID feature for digital sets.

2 LD 12 - Enable the Display of Access Prefix on CLID for attendant consoles.

3 LD 15 - Configure the access prefix table.

4 LD 16 - Enable the Display of Access Prefix on CLID feature.

LD 11 - Enable the Display of Access Prefix on CLID feature for digital sets.

Prompt	Response	Description
REQ:	NEW CHG	Add new data. Change existing data.
TYPE:	aaaa	Type of Meridian 1 proprietary set.
TN	 l s c u c u	Terminal Number. l = loop, s = shelf, c = card, u = unit for Options 51C-81C. c = card, u = unit for Option 11C.
DES	x...x	Office Data Administration System Designator.
CUST	xx	Customer Number as defined in LD 15.
...	...	
CLS	DAPA	Allow Display of Access Prefix on CLID. (DAPD) = Deny Display of Access Prefix on CLID.

LD 12 - Enable the Display of Access Prefix on CLID for attendant consoles.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	aaaa	Attendant type. Where aaaa = 1250 or 2250.
TN	l s c u c u	Terminal Number. l = loop, s = shelf, c = card, u = unit for Options 51C, 61C, 81C. c = card, u = unit for Option 11C.
SETN	l s c u c u	Second Terminal Number. l = loop, s = shelf, c = card, u = unit for Options 51C, 61C, 81C. c = card, u = unit for Option 11C.
CUST	xx	Customer Number as defined LD 15.
ANUM	1-63	Attendant Number.
...	...	
DAPC	DAPA	Allow Display of Access Prefix on CLID. (DAPD) = Deny Display of Access Prefix on CLID.

LD 15 - Configure the access prefix table.

Prompt	Response	Description
REQ:	CHG	Change existing data block.
TYPE:	FTR	Customer Features and options.
CUST	xx	Customer Number associated with this feature.
...	...	
DAPC	YES	Configure Display of Access Prefix table entry option. (NO) is the default.
TBL	1-15	Table number. Table 0 is non configurable. Precede table number with “X” to remove.

-NPI	aaaa	Numbering Plan Identification. Valid entries for aaaa include: UNKN - Unknown. E164 - Numbering Plan based on E164. PRIV - Private. E163 - Numbering Plan based on E163. TELX - Telex. X121 - Data X121. NATL - National.
--TON	aaaa	Type of number. Valid entries for aaaa include: UNKN - Unknown. INTL - International. NATL - National. ESPN - ESN_SPN. LOCL - Local. ELOC - ESN_LOC. ECDP - ESN_CDP.
---PREF	0-9999	Up to four digit Access Prefix for a unique NPI/TON combination in the table. Carriage return is taken as NIL Access Prefix value.
	#	Wild Character for replacement of any digit. The entry of "#" for wild card character is stored and displayed as "*". ***Note:*** The entry of "*" would be misinterpreted by the overlay supervisor for the standard overlay operation.)
	X	Reset the access prefix value to NIL.
--TON	...	Repeat for every value of TON for the particular NPI. Entry of Carriage return prompt is NPI.
-NPI	...	Repeat for every value of NPI.

LD 16 - Enable the Display of Access Prefix on CLID feature.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	RDB	Route Data Block.
CUST	xx	Customer Number as defined in LD 15.
ROUT	xxx	Route number. xxx = 0-511 for Options 51C, 61C, and 81C. xxx = 0-127 for Option 11C.
...	...	
ISDN	YES	Integrated Services Digital Network route.
...	...	
DAPC	YES	Enable feature at the route data block Level. (NO) = Disable feature at the route data block level.
- TBL	1-15	Prefix table number as defined in LD 15. Prompted only when ADDP is answered as YES.

Feature operation

No specific operating procedures are required to use this feature.

Display of Calling Party Denied

Contents

The following are the topics in this section:

Feature description 551
Operating parameters 555
Feature interactions 555
Feature packaging 559
Feature implementation 560
Task summary list 560
Feature operation 561

Feature description

Display of Calling Party Denied (DPD) permits Analog (500/2500 type) and Meridian 1 proprietary sets to either allow or deny associated name and number from being displayed on other sets when involved in a call. This feature is supported on internal calls (same node) and calls placed over a Meridian Customer Defined Network (MCDN) Integrated Services Digital Network (ISDN). Display of Calling Party Denied Class of Service options are programmed on a per set basis.

DPD uses the following Class of Service options in LD 10 and LD 11: Display Digits Allowed/Denied (DDGA/DDGD) and Name Display Allowed/Denied (NAMA/NAMD).

Display of Digits Denied (DDGD) Class of Service restricts digits from being displayed on another set when involved in a call. However, on the calling party's set, the dialed digits are always displayed regardless of the Class of Service assigned to the called party's set. Display of Digits Allowed (DDGA) allows the number associated with a set to be displayed when that set is involved in a call.

Display of Name Denied (NAMD) Class of Service restricts the name associated with a set from being displayed on another set when involved in a call. Display of Name Allowed (NAMA) allows the name associated with a set to be displayed when that set is involved in a call.

Table 44 outlines the possible configurations and the resulting display on both the calling and called parties' displays.

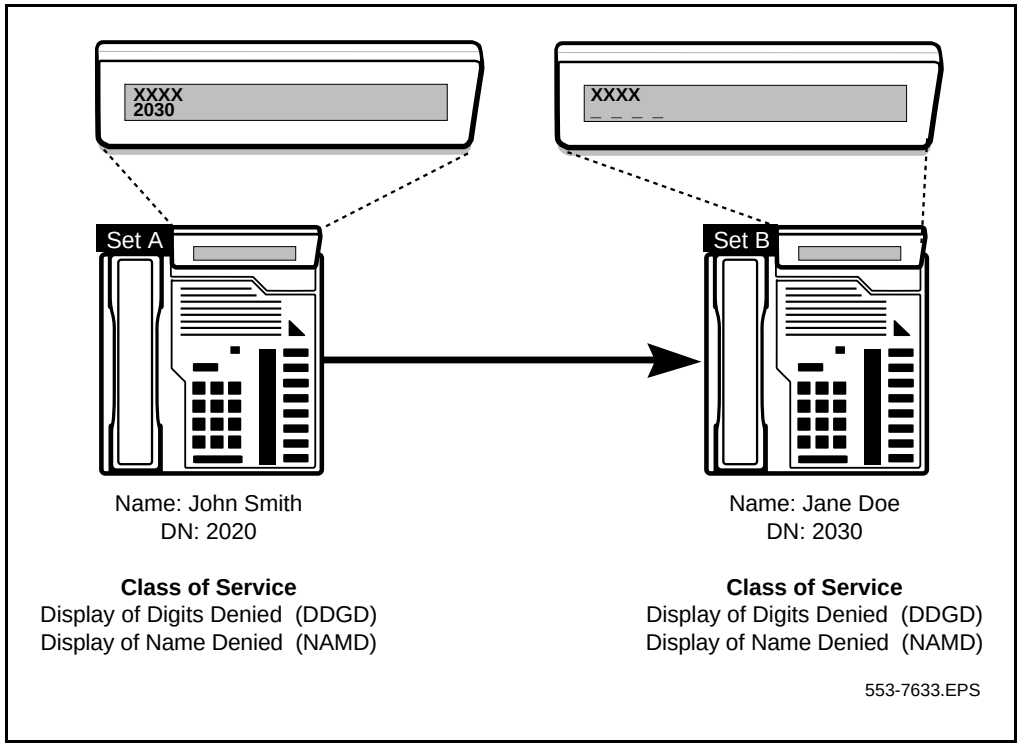
Table 44
Display Scenarios on Calling and Called Party's Sets

CALLING PARTY'S CLASS OF SERVICE	CALLED PARTY'S CLASS OF SERVICE	DISPLAY OF CALLING PARTY	DISPLAY OF CALLED PARTY
NAMA DDGA	NAMA DDGA	Name of Called Party Called Party's Number	Name of Calling Party Calling Party's Number
NAMA DDGA	NAMD DDGD	X X X X Called Party's Number	Name of Calling Party Calling Party's Number
NAMD DDGD	NAMA DDGA	Called Party's Name Called Party's Number	X X X X – – – –
NAMD DDGD	NAMD DDGD	X X X X Called Party's Number	X X X X – – – –
NAMA DDGD	NAMD DDGA	X X X X Called Party's Number	Name of Calling Party – – – –
NAMD DDGA	NAMA DDGD	Called Party's Name Called Party's Number	X X X X Calling Party's Number

Figure 50 illustrates the functionality of Display of Calling Party Denied (DPD) on a nodal basis when both the calling and called parties have enabled DPD Class of Service options. The calling party has configured a Digit Display Denied (DDGD) and Name Display Denied (NAMD) Class of Service. The called party has the same Class of Service options programmed. The display of the calling party's associated name and number is restricted on the called party's set. The calling party's number is replaced by a string of dashes (– – – –), where each "-" represents a suppressed digit. The associated name is replaced by a string of four Xs (XXXX).

On the calling party's set, the name associated with the called party is replaced by a string of four Xs (XXXX). However, the dialed digits remain displayed on the calling set.

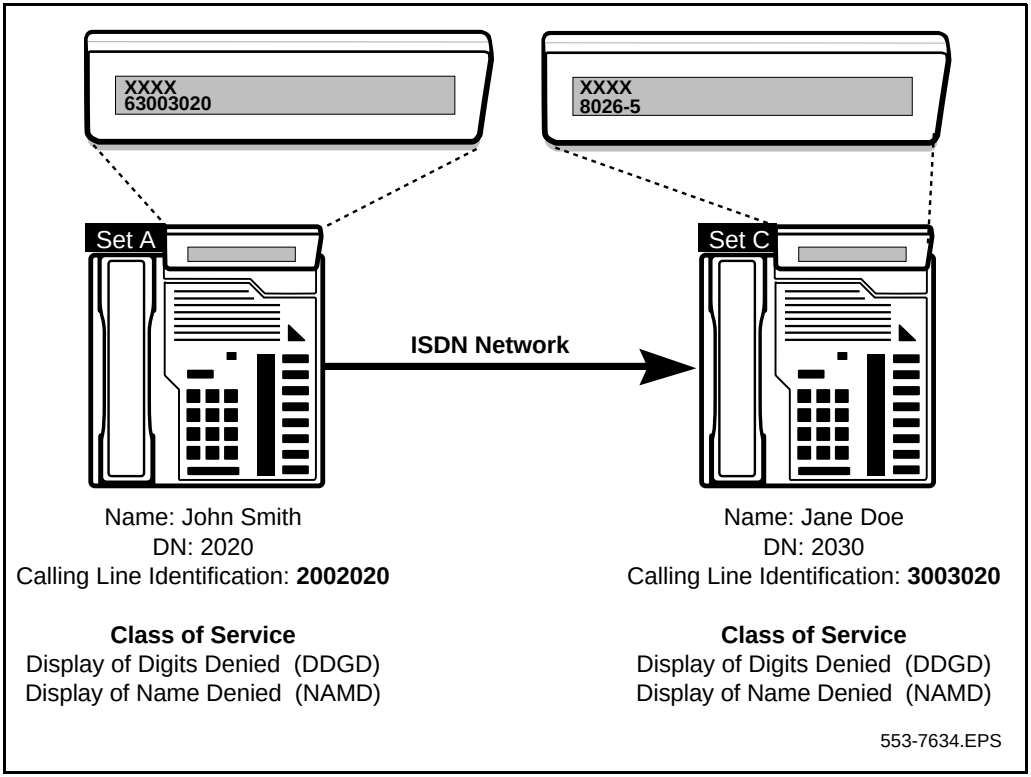
Figure 50
Calling Party and Called Party on the Same Node



As illustrated in Figure 51, for calls placed over a MCDN ISDN network, Display Digits Denied (DDGD) Class of Service on the calling party's set prevents the Calling Line Identification (CLID) from being displayed on the called party's set. In this case, the calling party's CLID is replaced by the ISDN route access code and route member number. If the calling party has configured Name Display Denied (NAMD), the calling party's associated name is not displayed on the called party's set. The associated name is replaced by a string of four Xs (X X X X).

On the calling party's set, the name associated with the called party is replaced by a string of four Xs (X X X X). However, the dialed digits remain displayed on the calling set.

Figure 51
ISDN Network Calls



Operating parameters

Display of Calling Party Denied (DPD) is only supported on internal calls, Meridian Customer Defined Network (MCDN) ISDN networks and the interface to the public network.

This feature does not support calls over DASS/DPNSS1 trunks.

Display of Calling Party Denied is not supported on ISDN BRI sets.

The dialed digits always appear on the display of the calling party's set. This occurs whether or not the called party has a Digit Display Denied (DDGD) Class of Service. However, if the dialed digits represent a Multiple Appearance Directory Number (MADN), the calling party's display reflects the Class of Service of the answering set.

Feature interactions

Attendant Console

A local attendant console's display is not impacted by this feature. Display is provided to an attendant regardless of the Class of Service configured on a local set. In order to allow calls placed over an ISDN network to be displayed on the Attendant Console when a remote set has a denied Class of Service (DDGD/NAMD), Network Attendant Service (NAS) must be configured. Then the denied Class of Service is ignored.

Call Detail Recording

For internal calls, calling and called party's Directory Numbers are included in Call Detail Recording (CDR) records regardless of the set's Class of Service. For MCDN ISDN network calls, the calling party's or connected party's number is included in the CDR regardless of the set's Class of Service.

Call Forward All Type

When a set activates any of the call forwarding features, the displays given on the calling set and the terminating set are in accordance with the Class of Service of the sets involved in the call.

If the terminating set has Dialed Name Display Denied (DNDD), the display on the terminating set reflects the name and number of the calling party and the name and the number of the forwarding set.

If the terminating set has Dialed Name Display Allowed (DNDA), the display on the terminating set reflects the number of the calling party and the name and number of the forwarding set. In both cases, the terminating set's display is in accordance with the DPD Class of Service options of the calling and forwarding sets.

For a MCDN ISDN call, the calling party's Calling Line Identification (CLID) is replaced with the ISDN route access code (ACOD) and the route member number, and the calling party's name is replaced by a string of four Xs (X X X X).

The display given on the calling set of an internal call, which has been forwarded to a set within the same switch, includes the name and number of the terminating set along with the number of the forwarding set. If the DPD Class of Service options, which are specified for the terminating set, indicate that the display of the name and number of the terminating set be denied, then on the calling set, the name of the terminating set is replaced by a string of four Xs (X X X X). The number is replaced by dashes (- - - -). If the number of the terminating set is blocked from being displayed on the calling set, the number of the forwarding set is also blocked from being displayed on the calling set, regardless of the DPD Class of Service options of the forwarding set. Conversely, if the display of the terminating set's number is allowed in the calling set, then the number of the forwarding set is also displayed on the calling set, irrespective of the DPD Class of Service options of the forwarding set.

Call Hold

When a call is retrieved from hold, the calling and called parties' displays reflect their individual DPD Class of Service options.

Call Park

When the Call Park timer expires on a parked call, a set's display reflects the Directory Number the call is parked against. The display does not include the name and DN of the calling party. When a parked call is retrieved by another set, display information is based on the DPD Class of Service of the individual sets.

Call Pickup

When a call is picked up from another set, the terminating set's display is in accordance with the Class of Service of the dialed and calling sets. The calling party's display includes the dialed DN, the terminating DN and the name of the terminated set. However, if the terminating set has Digit Display Denied (DDGD), then both the dialed and terminating sets' DNs are blocked from the calling party's display. The same occurs when Digit Display Allowed (DDGA) is configured on the terminating set. Both the dialed and terminating sets' DNs are displayed on the calling party's set, regardless of the Class of Service of the dialed set.

Call Transfer

When a set transfers a call, display information is updated according to the Class of Service of the respective sets. This occurs for both internal and ISDN network calls.

If an unsupervised call transfer occurs on an internal call, the DN of the terminating set is displayed to the calling party regardless of the DPD Class of Service options that are configured on the terminating set.

Calling Party Name Display

If Calling Party Name Display Denied (CNDD) is configured for a set, then the name associated with that set is not displayed when it is involved in a call. This is so regardless of the DPD Class of Service Options of that set.

Calling Party Privacy

Calling Party Privacy takes precedence over Display of Calling Party Denied on outgoing calls over a MCDN ISDN network. This precedence pertains to the display of the calling party's name and number on the called party's set.

Calling Party Privacy does not affect internal calls using Display of Calling Party Denied.

Conference

For internal conference calls, display information is not provided on any of the conferee's sets. When setting up a conference call, by conferencing one set at a time, the display on the conferee's set is in accordance with the Class of Service of the individual sets.

For network conference calls, display is provided. This is in accordance with the DPD Class of Service options of the individual sets.

Dial Intercom

Display information on sets that are involved in a Dial Intercom Group (DIG) call is based on the individual Class of Service of each set. If a DN is denied for a set involved in a DIG call, the DIG number for that set is replaced by one dash (–) in the case of 10 DIG stations. For 100 DIG stations, the DIG number is replaced by two dashes (– –).

Group Call

The calling party's display shows the DN of the last set to connect into the Group Call regardless of the Class of Service. The called set displays the Group Number only.

Hot Line

Display information on sets in a Hot Line call is based on the individual Class of Service of each set.

Meridian 911

An incoming M911 call with Automatic Number Identification (ANI) information always displays ANI digits on the terminating set regardless of the calling party's DPD Class of Service.

Meridian Mail

A calling party's name and/or DN within Meridian Mail are not impacted by this feature. When a Digit Display Denied (DDGD) call is forwarded to Meridian Mail, the calling party's DN is provided to Meridian Mail and is available when reviewing messages.

Multiple Appearance Directory Number

When a Multiple Appearance Directory Number (MADN) is dialed and ringing, the calling party's display does not show name information, provided that at least one of the MADN TNs has Name Display Denied (NAMD) Class of Service. Once a call is answered, the calling party's set reflects the DPD Class of Service options of the answering set.

The called party's display reflects the DPD Class of Service options of the calling party's set.

Multi Party Operations - Call Join

When three parties are joined using the Call Join capabilities of the Multi Party Operations feature, display information is not provided on any of the conferee's sets. When setting up a conference call, by conferencing one set at a time, the display on the conferee's set is in accordance with the individual set's Class of Service. If one set leaves a three party conference, display information on the remaining sets is based on the individual Class of Service of each set.

Network Attendant Services

When a call is placed to an attendant over an ISDN network with Network Attendant Services (NAS) configured and Calling Party Name Display (CPND) equipped, the Attendant Console displays the calling party's DN and name. The same occurs when an attendant places a call over the network; however, an Attendant Console's display shows the connected party name and number.

If NAS is not configured, the name and calling/connected party's number is displayed to the attendant provided that the calling/connected party has the Display of Calling Party Denied (DPD) Class of Service options configured to Allowed. If Class of Service options are set to Denied, then this information is not displayed to the attendant.

No Hold Conference Voice Call

Display information on sets involved in a No Hold Conference and Voice call is based on the individual Class of Service of each set.

Feature packaging

For internal calls, Display of Calling Party Denied (DPD) requires Calling Party Name Display (CPND) package 95.

For ISDN Network calls the following packages and their dependencies are also required:

- Calling Party Name Display (CPND) package 95;
- Integrated Service Digital Network (ISDN) package 145; and
- Network Attendant Services (NAS) package 159.

Note: The NAS package is required to display a calling party's name and DN on the attendant console, when using the Display of Calling Party Denied feature within an ISDN PRI private network. With NAS configured and Calling Party Name Display equipped, the attendant console will display the calling party's name and DN, regardless of the Display of Calling Party Denied Class of Service of the calling party's set. Without NAS, if the Display of Calling Party Denied Class of Service of the calling party's set is Denied, the name and DN of the calling party will not be displayed on the attendant console.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 10 – Deny Directory Number Display and Name Display for Analog (500/2500 type) sets.

2 LD 11 – Deny Digit Display and Name Display for Meridian 1 proprietary sets.

LD 10 – Deny Directory Number Display and Name Display for Analog (500/2500 type) sets.

Prompt	Response	Description
REQ:	CHG	Change.
TYPE:	500	500/2500 type set data block.
TN	l s c u	Terminal Number.
	c u	For Option 11.
...		
CLS	DDGD	Digit Display Denied DDGA = Digit Display Allowed (default).
CLS	NAMD	Name Display Denied NAMA = Name Display Allowed (default).

LD 11 – Deny Digit Display and Name Display for Meridian 1 proprietary sets.

Prompt	Response	Description
REQ:	CHG.	Change.
TYPE:	xxxx	Telephone type, where: xxxx = SL1, 2006, 2008, 2009, 2016, 2018, 2112, 2216, 2317, 2616 or 3000.
TN	l s c u	Terminal Number.
	c u	For Option 11C.
...		
CLS	DDGD	Digit Display Denied DDGA = Digit Display Allowed (default).
CLS	NAMD	Name Display Denied NAMA = Name Display Allowed (default).

Feature operation

No specific operating procedures are required to use this feature.

DPNSS1/DASS2 to Q.931 Gateway

Contents

The following are the topics in this section:

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Regional material statement

The information presented in this section does not pertain to all market regions. Contact your system supplier or your Nortel Networks representative to verify support of this product in your area.

Feature description

This feature allows a Meridian 1 node to act as a gateway between DPNSS1, DASS2 and Q.931 (ISDN PRI) protocols.

This gateway supports these functionalities:

- basic call service (circuit switch voice calls)
- call line identification
- connected line identification
- call diversion

- coordinated dialing plan
- network ring again, between DPNSS1 and Q.931 protocols

Operating parameters

The feature has the following limitation:

- PSTN incoming trunks are not to be allowed access to PSTN outgoing trunks

Feature interactions

There are no feature interactions associated with this feature.

Feature packaging

This feature is packaged as UK Program (UK) package 190 and it has the following dependencies:

- Integrated Digital Access (IDA) package 122;
- Digital Private Network Signaling System (DPNSS) package 123;
- Digital Access Signaling System 2 (DASS2) package 124;
- Integrated Services Digital Network (ISDN) package 145; and
- 2.0 Mbit Primary Rate Interface (PRI2) package 154.

Interworking of Network Ring Again across DPNSS and Q.931 requires the Advanced ISDN Network Services (NTWK) package 148.

Feature implementation

There are no specific implementation procedures for this feature.

Feature operation

No specific operating procedures are required to use this feature.

DPNSS1 Route Optimisation/MCDN Trunk Anti-Tromboning Interworking

Contents list

The following are the topics in this section:

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Feature interactions 575
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Feature operation 577

Reference list

The following are the references in this section:

- *DPNSS1: Product Overview Guide* (553-3921-100)
- *DPNSS1: Features and Services Guide* (553-3921-300)

Regional material statement

The information presented in this section does not pertain to all market regions. Contact your system supplier or your Nortel Networks representative to verify support of this product in your area.

Feature description

The Digital Private Networking Signalling System No.1 (DPNSS1) Route Optimisation (RO)/Meridian Customer Defined Networking (MCDN) Trunk Anti-Tromboning (TAT) Interworking feature provides RO and TAT interworking at DPNSS1/MCDN gateway nodes.

> ***Note:*** For detailed information on the DPNSS1 Route Optimisation feature, please refer to the *DPNSS1: Product Overview Guide* (553-3921-100) and the *DPNSS1: Features and Services Guide* (553-3921-300). For detailed information on the Trunk Anti-Tromboning feature, please refer to the feature description module in this book.

RO/TAT interworking scenarios

RO/TAT interworking within a DPNSS1 to MCDN gateway

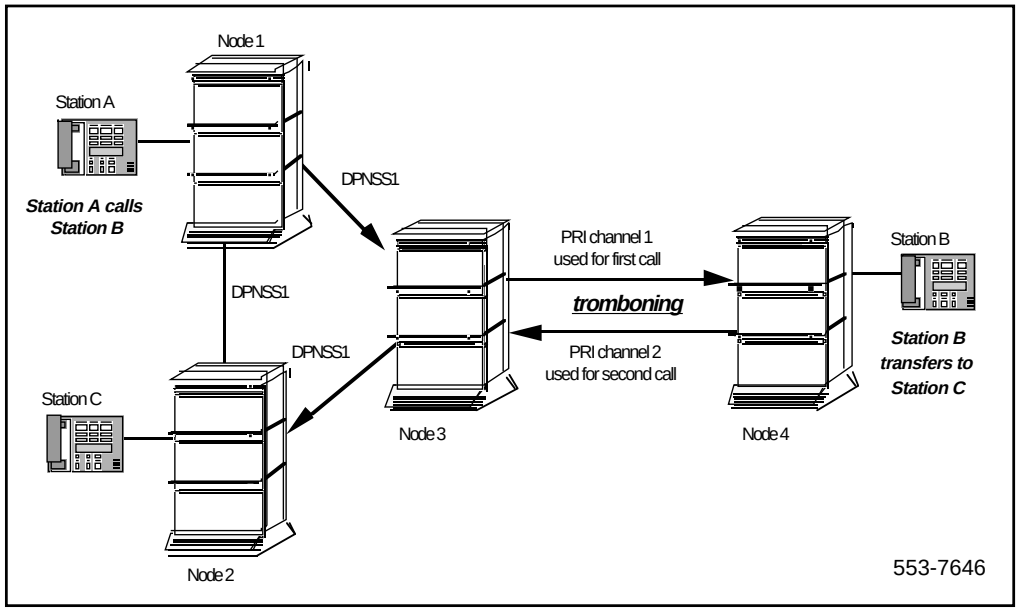
The following example presents a case where RO/TAT interworking occurs within a DPNSS1 to MCDN gateway.

> ***Note:*** In this example, we have used the case where a call has been redirected due to Network Call Transfer. The same functionality would apply if the call had been redirected by Network Call Forward No Answer, and Network Hunting, or modified by Network Call Transfer or Attendant Call Transfer.

Referring to Figure 52, Station A, located at Node 1 on the DPNSS1 side of the DPNSS1/MCDN gateway, calls Station B located at Node 4 on the MCDN side of the gateway. It is to be assumed that the optimum DPNSS1 route has been selected at the originating node (the case where a non-optimum route is selected is discussed in the note following Figure 53.) Station B activates Network Call Transfer to Station C, located at Node 2 on the DPNSS1 side of the gateway.

Upon activation, the existing call is put on hold and a new call is originated to Station C. Station C Answers. Station B completes the call transfer, leaving A connected to C using two DPNSS1 trunks and two PRI trunks.

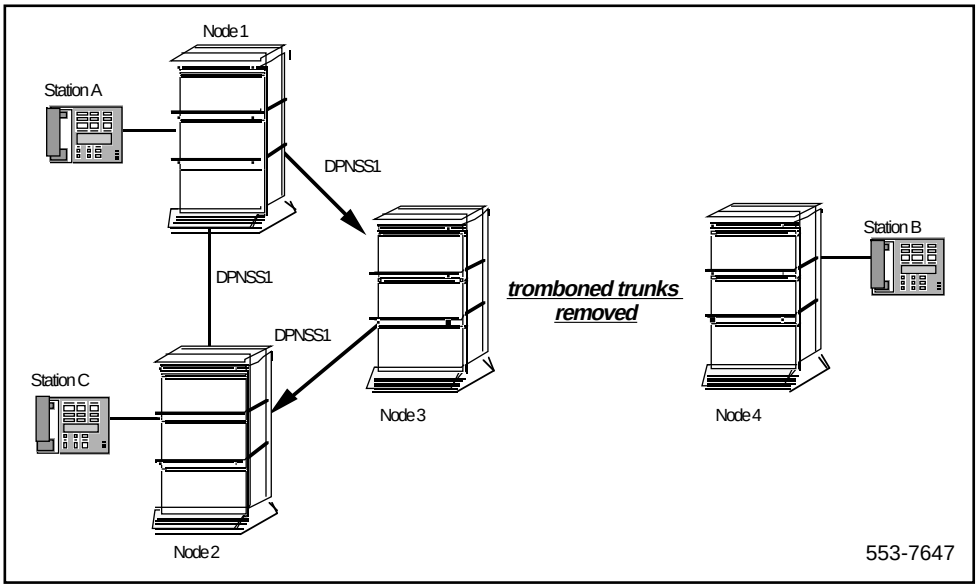
Figure 52
DPNSS1/MCDN scenario with Network Call Transfer, before RO/TAT optimisation



Note: The Network Call Transfer/Three Party Service gateway is not supported at the gateway Node 3. Therefore, RO is not initiated at Node 1, and the non-optimised DPNSS1 trunks remain connected.

On the MCDN side, TAT is initiated at Node 4. The call between A and C is bridged, and the redundant PRI trunks are removed between Node 4 and Node 3. For the meantime, the non-optimised DPNSS1 trunks remain connected, as shown in Figure 53.

Figure 53
DPNSS1/MCDN RO/TAT Interworking scenario, after TAT has been applied

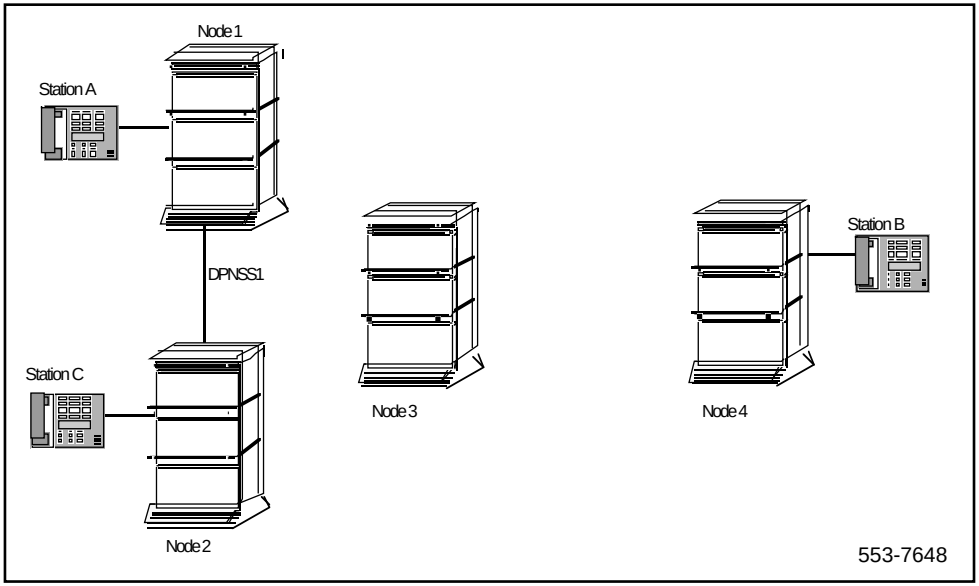


When TAT is completed on the MCDN side, The RO/TAT Interworking feature initiates RO on the DPNSS1 side by simulating a transfer at the gateway Node 3. The Three Party Service feature initiates signaling to update displays. Then, RO is initiated at Node 1, the originating node. The DPNSS1 trunks are dropped between Node 3 and 2 and Node 3 and Node 1, with Station A and Station C being connected over one DPNSS1 trunk. This is shown in Figure 54.

Note: If a non-optimum route is used at the originating node or at any transit node, Route Optimisation may start from Node 1 (the normal RO operation for the first call optimisation) or Node 3 (the normal RO operation for the second call optimisation), before TAT is completed. If TAT invocation is received on Node 3 while RO is being applied between Node 1 and Node 3 or Node 3 and Node 2, the completion of TAT is delayed until RO is totally finished.

Upon the completion of TAT on Node 3, a call transfer operation is simulated, and a new RO operation is initiated to remove any potential triangulation of routes.

Figure 54
DPNSS1/MCDN RO/TAT Interworking scenario, after RO has been applied



Note: If Station A is an attendant, TAT takes place on the MCDN side of the gateway but RO cannot take place on the DPNSS1 side. This is a RO limitation.

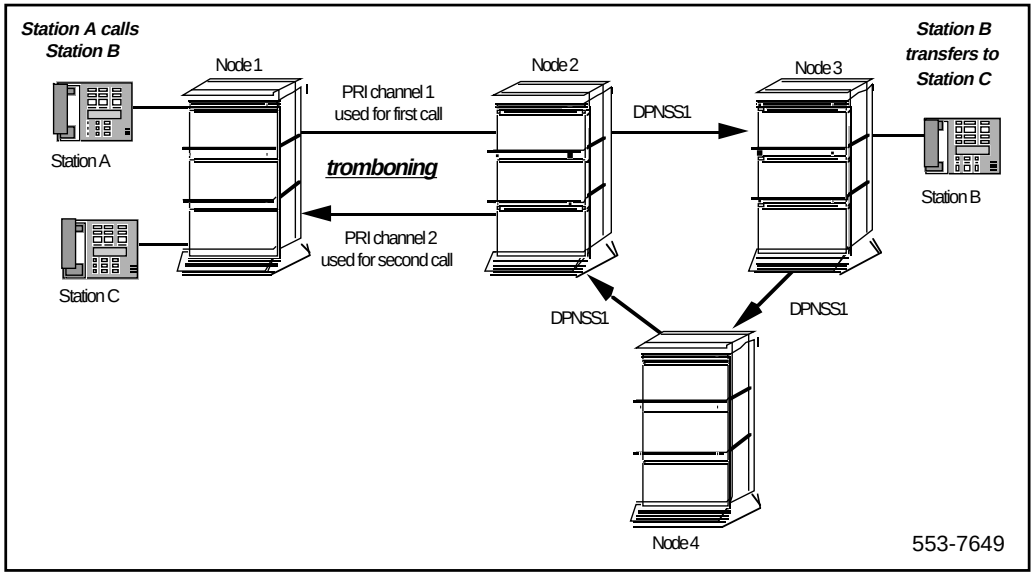
RO/TAT interworking within a DPNSS1 to MCDN gateway

The following example presents a case where RO/TAT interworking occurs within an MCDN to DPNSS1 gateway. Here, too, we are using the case of a call being transferred (using the DPNSS1 Three Party Service feature) across the gateway.

Referring to Figure 55, Station A, located at Node 1 on the MCDN side of the MCDN/DPNSS1 gateway, calls Station B located at Node 3 on the DPNSS1 side of the MCDN/DPNSS1 gateway. Station B transfers the call (using the Three Party Service feature) to Station C, also located at Node 1 on the MCDN side of the gateway.

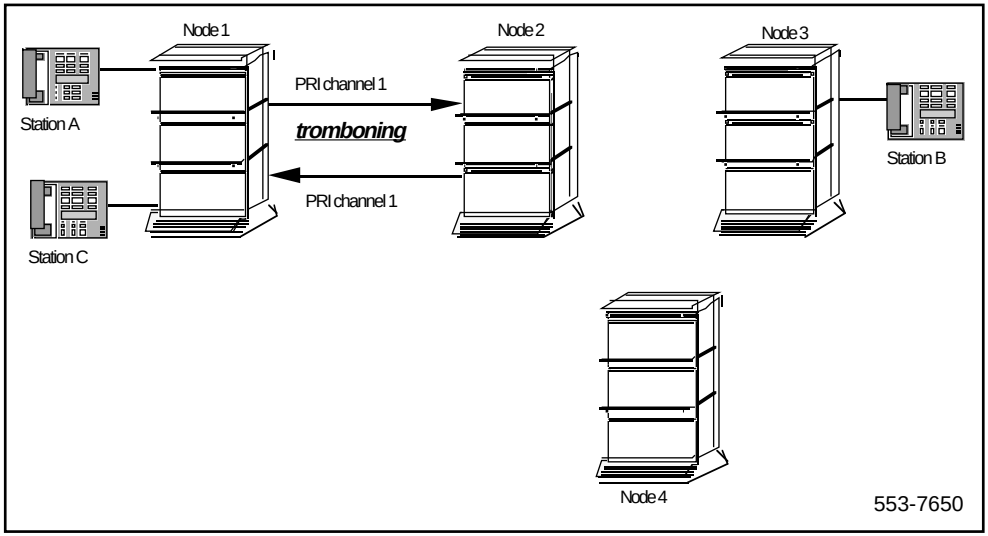
Upon activation, the existing call is put on hold and a new call is originated to Station C. Station C Answers. Station B completes the call transfer, leaving A connected to C using three DPNSS1 trunks (in the example, the call is routed through Node 4) trunks and two PRI trunks.

Figure 55
MCDN/DPNSS1 RO/TAT Interworking scenario, before RO has been applied



Once Three Party Service messaging has taken place, Node 2 initiates RO. The initial DPNSS1 routes are cleared. Node 2 becomes a MCDN/MCDN transit node, and the two tromboning PRI routes between Node 2 and Node 1 remain, as shown in Figure 56.

Figure 56
MCDN/DPNSS1 RO/TAT Interworking scenario, after RO has been applied

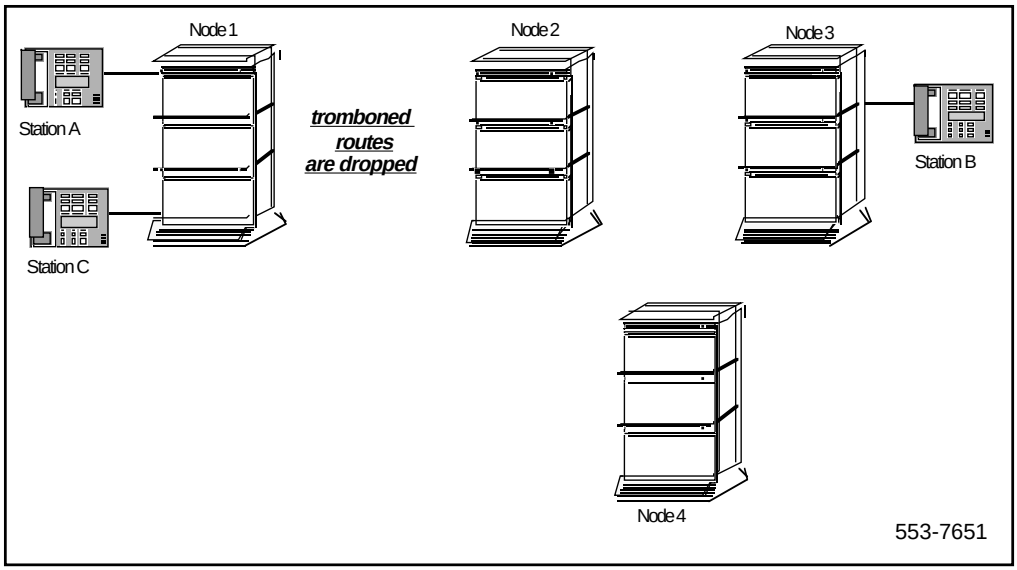


As soon as RO is completed, the RO/TAT initiates TAT at gateway Node 2. After TAT has been completed at Node 1, Node 2 simulates a transfer message to both Station A and Station C. This allows the Network Call Redirection feature to update the displays.

> ***Note:*** If the originating and terminating nodes are one and the same, and if this node is not a tandem node, as is the case for Node 1 in our example, the displays are updated without the notification from the Network Call Redirection feature.

TAT is then completed. The redundant routes are cleared, and Station A and Station C are bridged, as shown in Figure 57.

Figure 57
MCDN/DPNSS1 RO/TAT Interworking scenario, after TAT has been applied



Note 3: If Station A is an attendant, and the Network Attendant Service feature is configured, Station B cannot transfer to Station C, and no optimisation can take place. If NAS is not configured, Station B may transfer to Station C, and optimisation takes place as described in this example.

Note 4: In the case of call diversion on the DPNSS1 side (Diversion Immediate, Diversion on Busy, and Diversion on No Reply), there is no interaction with the RO/TAT Interworking feature (the interaction occurs between the Diversion and TAT features.) In the case of tromboning on the DPNSS1 side, the Diversion feature clears the DPNSS1 tromboning trunks before Station C answers the call. When C answers, TAT is applied transparently.

Note 5: Node 1 cannot be a DMS switch for the RO/TAT Interworking feature to operate.

RO/TAT interworking within multiple MCDN/DPNSS1 gateways

A RO/TAT Interworking is supported within a multiple gateway scenario, as illustrated by the following example. Referring to Figure 58, Station A on the originating node call Station B across the multiple gateway scenario over PRI and DPNSS1 trunks, as shown below. Station B then transfers to Station C, over different PRI/DPNSS1 trunks. When Station C has completed the call transfer, and Station C answers, TAT is first activated at the far end node, removing the two end PRI trunks. The RO/TAT Interworking feature then activates RO on the DPNSS1 portion of the gateway, removing the DPNSS1 trunks. Then, TAT is activated to remove the last two PRI trunks at the near end of the gateway, leaving Station C and Station A bridged, as shown in Figure 59.

Figure 58
RO/TAT Interworking within multiple DPNSS1/MCDN gateways, before RO/TAT

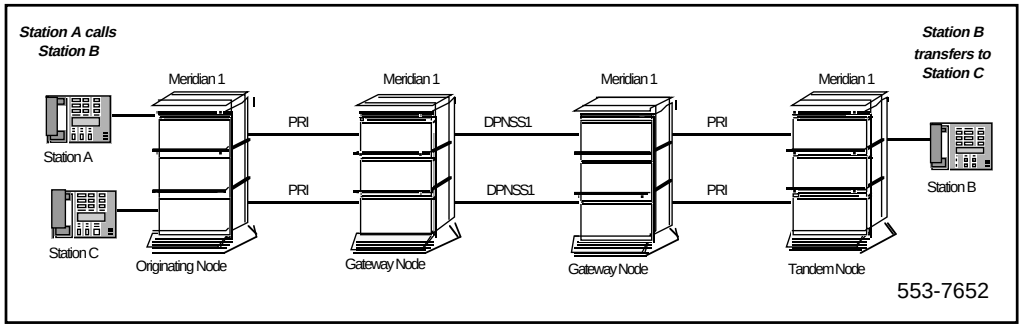
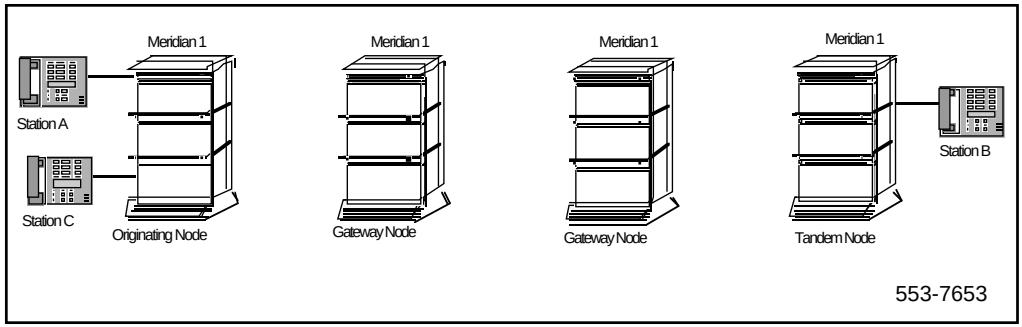


Figure 59
RO/TAT Interworking within multiple DPNSS1/MCDN gateways, after RO/TAT



Abnormal RO/TAT interworking scenarios

The following are possible scenarios whereby the RO/TAT Interworking feature may function abnormally.

1 RO fails or is not configured, and TAT is configured.

In the case of a DPNSS1/MCDN gateway, TAT optimises the PRI trunks on the MCDN side, but the DPNSS1 trunks are not optimised on the DPNSS1 side.

In the case of an MCDN/DPNSS1 gateway, RO is not activated and the DPNSS1 side is not optimised. Since the DPNSS1 trunks remain, TAT is not invoked at the gateway node, even though it is equipped. Therefore, if RO is not activated, the RO/TAT Interworking functionality is not invoked.

2 TAT fails or is not configured, and RO is configured.

In the case of an MCDN/DPNSS1 gateway, RO optimises the DPNSS1 trunks on the DPNSS1 side, but the MCDN trunks are not optimised on the MCDN side.

In the case of a DPNSS1/MCDN gateway, TAT is not activated on the MCDN side and the tromboning PRI trunks remain. Since the PRI trunks remain, RO is not invoked at the gateway node, even though it is equipped, and DPNSS1 trunks are not optimised on the DPNSS1 side. Therefore, if TAT is not activated, the RO/TAT Interworking functionality is not invoked.

Operating parameters

Although Trunk Anti-Tromboning functions between a Meridian 1 switch and a DMS switch, no TAT messaging is initiated to a DMS switch after Route Optimisation is activated on the DPNSS1 side of an ISDN MCDN/DPNSS1 gateway.

As explained in “Abnormal RO/TAT interworking scenarios” on page 574, both RO and TAT must be activated in order for the RO/TAT Interworking functionality to operate.

The RO/TAT Interworking functionality is only activated after call connection.

RO/TAT Interworking functionality is not applied if the originating party of the first call or the terminating party of the second call is on a conference call.

RO/TAT Interworking functionality is not applied if the originating party of the first call is an attendant.

RO/TAT Interworking functionality is not applied to data calls.

Route Optimisation may be applied to any portion of a DPNSS1 network, as long as both the originating node and terminating nodes are equipped with the RO feature. This is because optimisation is performed by initializing a new call between the originating node and terminating node. However, for the same to apply to Trunk Anti-Tromboning within an MCDN network, every exchange along the network must be equipped with the TAT feature. This is because TAT releases trunks step by step.

Multiple hops across a gateway are supported separately by RO and TAT.

Feature interactions

Multiple Hops

Multiple hops are supported within every RO/TAT Interworking gateway scenario, since they are supported separately by RO and TAT.

Network Attendant Service

If tromboning trunks are removed on the MCDN side of a RO/TAT Interworking gateway scenario by the Network Attendant Service feature (since NAS has predence over TAT), the RO/TAT Interworking functionality is not invoked. The result is that, if NAS is equipped, attendant-extended calls that are in a tromboning state are optimised on the MCDN side, but DPNSS1 trunks are not optimised on the DPNSS1 side of the RO/TAT Interworking gateway scenario.

Network Call Pickup

If tromboning trunks are removed on the MCDN side of a gateway scenario by the Network Call Pickup feature (since Network Call Pickup has predence over TAT), TAT is invoked since the Network Call Pickup action is considered as a call forward action. RO/TAT functionality is invoked upon completion of the TAT operation.

Network Call Redirection

If Network Call Redirection is not configured in an DPNSS1/MCDN gateway, the displays are updated normally, since the RO/TAT Interworking feature is not affected.

If Network Call Redirection is not configured in an MCDN/DPNSS1 gateway, the displays are not updated on the bridged sets on the MCDN side. However, if the bridged sets are on the same node, the displays are updated even though NCRD is not configured.

Three Party Service

DPNSS1 Three Party Service is required for every RO/TAT Interworking scenario.

Trunk Route Optimization before Answer

There is no interaction between the Trunk Route Optimization before Answer feature and the RO/TAT Interworking feature, since Trunk Route Optimization before Answer is activated before call completion, and the RO/TAT Interworking functionality is only activated after call connection.

Virtual Network Services

The RO/TAT Interworking feature is not supported over VNS trunks, since VNS uses only MCDN signaling (DPNSS1 is not supported.)

Feature packaging

For the software packages required to support the DPNSS1 Route Optimisation/MCDN Trunk Anti-Tromboning Interworking feature, consult the following publications:

- For DPNSS1 network functionality:
  - *DPNSS1: Product Overview Guide* (553-3921-100);
- For MCDN Network Attendant Service interworking, refer to the NAS feature description module in this book.

Feature implementation

No new steps are required to configure the DPNSS1 Route Optimisation/MCDN Trunk Anti-Tromboning Interworking feature. However, the following basic configuration must be done:

- Configure MCDN Trunk Anti-Tromboning at the far-end switch, in LD 17 (TAT is configured on a D-Channel basis, and not on a route basis). Refer to the Trunk Anti-Tromboning feature module in this book.
- Configure DPNSS1 Route Optimisation options, in LD 15. Refer to *DPNSS1: Features and Services Guide* (553-3921-300).
- Configure call display transfer indication for DPNSS1 Three-Party Service, in LD 95. Refer to *DPNSS1: Features and Services Guide* (553-3921-300).
- Optionally (to update terminal displays), configure Network Call Redirection, using LD 15, LD 16, LD 95, LD 10, and LD 11. Refer to the Network Call Redirection feature module in this book.

Feature operation

No specific operating procedures are required to use this feature.

E.164/ESN Numbering Plan Expansion

Contents

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Summary of Meridian 1 base features enhancements 583
Summary of Automatic Call Distribution (ACD) enhancements . . 584
Summary of Customer Controlled Routing (CCR) enhancements . . 584
Summary of ISDN features enhancements 585
Operating parameters 585
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Regional material statement

The information presented in this section does not pertain to all market regions. Contact your system supplier or your Nortel Networks representative to verify support of this product in your area.

Feature description

The E.164/ESN Numbering Plan Expansion feature provides the capabilities to meet the International Telegraph and Telephone Consultative Committee (CCITT) recommendation E.164 for Integrated Services Digital Network (ISDN) and Public Switching Telephone Network (PSTN) dialing.

Generally, the following enhancements are offered by this feature:

- the support of the numbering plan for ISDN and PSTN dialing has been increased to a 15-digit maximum, from a 12-digit maximum;
- the removal of the leftwise-unique restriction imposed on ESN Supplemental Digit Restriction and Recognition (SDRR) entry codes. For example, if 555 is an existing entry, an entry of either 55 or 5551212 can be entered;
- the addition of "allow" (ALOW) as a Supplemental Digit Restriction and Recognition (SDRR) entry type in LD 90. There are now nine entry types for Supplemental Digit Restriction and Recognition. One entry type (DENY), denies a call from going through if the digits in the SDRR entry match the dialed digits. There are seven other entry types that provide special treatments, if the digits in the SDRR entry match the dialed digits. The ALOW entry allows a call to go through, if the dialed digits did not match any entry within the Supplemental Digit Restriction and Recognition table;
- the Special Number Translation (SPN) screening digits scheme is changed;
- the capability of the Meridian 1 base features to store digits is increased to 31 digits;
- the capability to send up to 32 digits to the Extended Conference and Tone & Digit Switch card, allowing an International Number to be sent in a single Automatic Number Identification (ANI) message. Previously, only 16 digits could have been outpulsed in a single ANI message, which included the start digit, the end digit, and an optional information digit. This left only 13 or 14 digits of the actual International Number to be outpulsed in a single ANI message. This meant that the International Number may have been sent in two separate ANI messages.

The specific enhancements delivered by the E.164/ESN Numbering Plan Expansion feature are provided in the tables that follow.

Summary of expanded ESN functionalities

Table 45 summarizes the changes made to the ESN functionality. Please note that the components that are not affected are not listed.

Table 45
Summary of ESN changes (Part 1 of 2)

Component	Old	Expanded
Maximum number of digits for a Special Numbering Translation screening.	11	19
Maximum number of Digit Manipulation Index (DMI) deletion digits.	15	19
Maximum number of Digit Manipulation Index (DMI) insertion digits.	24	31
Maximum number of Supplemental Digit Restriction and Recognition (SDRR) tables, with BARS.	256	1500
Maximum number of Supplemental Digit Restriction and Recognition (SDRR) tables, with NARS.	512	1500
Maximum number of words per Supplemental Digit Restriction and Recognition (SDRR) entry.	3	4
Maximum number of digits in each Supplemental Digit Restriction and Recognition (SDRR) entry.	7	10
Maximum length of Flexible Numbering Plan (FNP) Flexible Digit Number Length (FLEN) numbers for Special Number Translation (SPN).	16	24
Maximum length of Flexible Numbering Plan (FNP) Flexible Digit Number Length (FLEN) numbers for Trunk Steering Codes (TSCs).	16	24
Maximum number of digits per Free Special Number Screening (FSNS) Special Number.	11	19

Table 45
Summary of ESN changes (Part 2 of 2)

Total number of digits for screening under Free Special Number Screening (FSNS).	14	22
Maximum number of possible Supplemental Digit Restriction and Recognition (SDRR) entry types.	8	9 (‘ALOW’ is added). ALOW is an entry type in LD 90. This entry allows a call to go through, as if the dialed digits did not match any entry within the Supplemental Digit Restriction and Recognition table.
Restriction imposed on Supplemental Digit Restriction and Recognition (SDRR) entry codes.	Leftwise Unique.	None. The leftwise-unique restriction, imposed on SDRR entry codes, is removed. For example, if 555 is an existing entry, an entry of either 55 or 5551212 can be entered.

Summary of Meridian 1 base features enhancements

Table 46 summarizes the changes made to the base Meridian 1 features functionality. Please note that the components that are not affected are not listed.

Table 46
Summary of Meridian 1 base features changes

Component	Old	Expanded
Maximum number of digits for an Autodial entry. Note that this enhancement does not apply to M3000 sets.	23	31
For the No Hold Conference functionality, the maximum number of digits for a Conference Autodial target DN entry.	23	31
Maximum number of digits for the Call Forward All Calls DN. Note that this enhancement does not apply to M2317 and M3000 sets.	23	31
Maximum number of digits for the Internal Call Forward DN.	23	31
For the Phantom DN functionality, the maximum number of digits for the Default Call Forward DN.	23	31
Maximum number of digits for the Customer Call Forward DN.	16	23
Maximum number of digits sent in an ANI message.	16	32

Summary of Automatic Call Distribution (ACD) enhancements

Table 47 summarizes the changes made to the ACD functionality. Please note that the components that are not affected are not listed.

Table 47
Summary of Meridian 1 ACD changes

Component	Old	Expanded
Maximum number of digits for the ACD Night Forward DN.	23	31
Maximum number of digits for the ACD Interflow DN.	23	31

Summary of Customer Controlled Routing (CCR) enhancements

Table 48 summarizes the changes made to the Customer Controlled Routing functionality. Please note that the components that are not affected are not listed.

Table 48
Summary of CCR changes

Component	Old	Expanded
Maximum number of Termination DN digits in the CCR ITR To-Route-A-Call message.	24	31

Summary of ISDN features enhancements

Table 49 summarizes the changes made to the ISDN functionality. Please note that the components that are not affected are not listed.

Table 49
Summary of ISDN changes

Component	Old	Expanded
For ISDN BRI basic call service line access (BRIL), the maximum number of Called Party Information Element digits.	24	31
For the ISDN QSIG interface, the maximum number of Called Party Information Element digits.	24	31
For the EuroISDN interface, the maximum number of Called Party Information Element digits.	20	31
For the ISDN BRI NI-1 Call Forward All Calls feature, the maximum number of digits for the forward DN.	20	31
For the ISDN BRI ETSI Call Forward All Calls feature, the maximum number of digits for the forward DN.	20	31
For the Overlap Signaling feature, the maximum number of digits that a user may dial before a SETUP message is sent over the D-channel. ***Note:*** Overlap Signaling is not supported in North America.	16	24

Operating parameters

All existing operating parameters that apply to the Meridian 1 ESN functionality, base system features and ISDN PRI and ISDN BRI networking features apply to the E.164/ESN Numbering Plan Expansion feature.

The enhancements introduced by the E.164/ESN Numbering Plan Expansion feature, pertaining to Called Party Information Element digits (CDPN), and forwarded and redirected DNs do not pertain to the M5317 and M5209 ISDN BRI terminals. This is because these terminals follow the BRI ETSI standard, placing a maximum limit of 24 digits on Called Party Information Element digits and redirected DNs.

The 31-digit expansion, pertaining to the Call Forward All Calls DN, does not apply to Meridian M2317 and M3000 sets, since their firmware limits entering a CFAC DN from the set to a maximum of 23 and 28 digits, respectively.

An Autodial key cannot be configured on a Meridian M3000 set; instead, the M3000 sets are equipped with a private directory, which allows automatic dialing of a stored DN entry by touching the corresponding name on the set's display screen. Since the firmware of the M3000 limits the length of a DN entry to a maximum of 28 digits, the 31-digit expansion pertaining to the Autodial does not apply to Meridian M3000 sets.

Since the Network Call Trace feature can outpulse a maximum of 21 digits to be printed on the TTY, the 31-digit expansion does not apply to Network Call Trace.

The 16 digit maximum, pertaining to the Calling Party Number, Connected Party Number, Redirecting Number and Redirection Number, has not been expanded by the E.164/ESN Numbering Plan Expansion feature.

If all the digits of a DN are dialed automatically, such as for a Speed Call or for any redial feature, only the first 31 digits are processed. This means that any digits that are inserted by, for example, network signaling, pretranslation or digit manipulation, are counted as part of these 31 digits. Therefore, even fewer than the automatically dialed digits may be processed.

Flexible Feature Codes (FFC) DNs may have a length of 1-7 digits. Call Forward All Calls (CFAC), Internal Call Forward All Calls (IFC) and Remote Call Forward (RCFW) are supported by FFCs, and can be activated, deactivated and verified using FFCs. When activating CFAC, using the Remote Call Forward FFC (RCFA), or when verifying the Call Forward DN, using the Call Forward All Call FFC (CFWV), the Remote Call Forward FFC (RCFV), or the Internal Call Forward All Calls FFC (ICFV), the FFC DN is kept, using eight of the available 31 digits. For the CFAC DN or ICF DN, this means that only 23 possible digits can be stored or verified using FFCs. As a result, this limitation does not accommodate the 31 digit CFAC DN and IFC DN expansion, introduced by the E.164/ESN Numbering Plan Expansion feature.

Calling Party Privacy (CPP) allows a caller to block his or her name from appearing on the called party display. The call is marked as a CPP call by entering a CPP FFC, up to seven digits long. This means that up to seven additional digits may have to be stored for automatic dialing. These digits are stored in sequence, and subsequent digits may not be processed.

In the case of CPP outpulsing, the CPP outpulsed digits (typically *67 or 1167) are stored after CPP has been activated. If this call goes over a trunk, the CPP outpulsed digits are sent to the far end to indicate that the call is a CPP call. For ISDN calls, a CPP flag is marked in the ISDN message. For non-ISDN CPP calls, digits that are already stored, such as for Call Forward, Autodial, and Speed Call, may be pushed out when the CPP digits are inserted, since only 31 digits can automatically be processed. This means that up to four digits may be removed from the digits that are outpulsed.

The SPN expansion, provided by the E.164/ESN Numbering Plan Expansion feature, applies to the DPNSS1/DASS2 UDP Interworking feature.

The System Access Enhancement (SAE) feature impacts the accepted values for the Call Forward All Calls DN, and the Internal Call Forward DN, when entered in LD 10 and LD 11. This feature allows all values between 4-31 to be accepted, rather than the normal accepted values of 4, 8, 12, 16, 20, 24, 28, 31. Also, the default is 4, rather than 16.

The Called Party Information Elements expansion, provided by the E.164/ESN Numbering Plan Expansion feature, applies to ISDN QSIG GF Transport feature.

Feature interactions

The E.164/ESN Numbering Plan Expansion feature does not interact with the Meridian 1 base system features and ISDN PRI and BRI networking features, other than as described in Table 45 to Table 49 and in the operating parameters.

Feature packaging

The E.164/ESN Numbering Plan Expansion feature does not introduce a new package. However, the following packages are required to support the new expansions.

For ESN expansions:

- Basic Alternate Route Selection (BARS) package 57;
- Network Alternate Route Selection (NARS) package 58; and
- Flexible Numbering Plan (FNP) package 160.

For ISDN expansions:

- Digit Display (DDSP) package 19;
- Integrated Services Digital Network (ISDN) package 145;
- Primary Rate Access (PRI) package 146;
- Integrated Service Digital Network Signaling Link (ISL) package 147;
- 2.0 Mbit Primary Rate Interface (PRI2) package 154;
- Overlap Signaling (OVLP) package 184;
- International Primary Rate Access (IPRA) package 202;
- Meridian 1 Extended Peripheral Equipment (XPE) package 203;
- Basic Rate Interface (BRI) package 216;
- Multi-purpose Serial Data Link (MSDL) package 222;
- Integrated Services Digital Network Basic Rate Interface Trunk Access (BRIT) package 233;
- Basic Rate Interface Line Application (BRIL) package 235;
- EuroISDN (EURO) package 261; and
- QSIG Interface (QSIG) package 263.

For base system features expansions:

- Optional Features (OPTF) package 1;
- 2500 Telephone Features (SS25) package 18;
- Basic Automatic Call Distribution (BACD) package 40;
- Automatic Call Distribution Basic, Package B (ACDB) package 41;
- Automatic Call Distribution Advanced, Package A (ACDA) package 45;

- 500 Telephone Features (SS5) package 73;
- Controlled Class of Service (CCOS) package 81;
- Background Terminal (BGD) package 99;
- Flexible Feature Codes (FFC) package 139; and
- Phantom Terminal Numbers (PHTN) package 254.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 10 – For analog (500/2500 type) sets, configure the expansion pertaining to the Autodial, Call Forward All Calls, Default Call Forward (for Phantom TNs) and Internal Call Forward DNs.

2 LD 11 – For Meridian 1 proprietary sets, configure the expansion pertaining to the Autodial, Call Forward All Calls, Default Call Forward (for Phantom TNs) and Internal Call Forward DNs.

3 LD 12 – For for attendant consoles, configure the expansion pertaining to the maximum length of the Autodial DN.

4 LD 15 – Configure the expansion pertaining to the Customer Call Forward DN.

5 LD 23 – Configure the expansion pertaining to the ACD Night Call Forward DN and the ACD Interflow DN.

6 LD 86 – For the ESN data block, configure the expansion pertaining to the maximum number of Supplemental Digit Restriction and Recognition blocks, and the maximum number of Digit Manipulation tables.

7 LD 86 – For the Digit Manipulation data block, configure the expansion pertaining to the maximum number of leading digits to be deleted and inserted.

8 LD 86 – For the Route List data block, configure the expansion pertaining to the minimum Overlap Digit Length.

9 LD 87 – For a Free Special Number Screening Index, configure the expansion pertaining to the maximum number of Special Numbers to be screened.

10 LD 87 – For a Trunk Steering Code, configure the expansion pertaining to the maximum number of Flexible Numbers.

11 LD 90 – For Network Translation tables, configure the expansion pertaining to the maximum number of Special Numbers digits, the maximum number of digits for Flexible Numbers, the maximum number of Supplemental Digit Restriction and Recognition digits per entry, and the addition of "allow" (ALOW) as a new Supplemental Digit Restriction and Recognition type.

LD 10 – For analog (500/2500 type) sets, configure the expansion pertaining to the Autodial, Call Forward All Calls, Default Call Forward (for Phantom TNs) and Internal Call Forward DNs.

Prompt	Response	Description
REQ:	NEW CHG	Add new data, or change existing data.
TYPE:	500	Type of telephone set.
TN	l s c u	Terminal Number.
	c u	For Option 11C.
...		
FTR	ADL nn x..x	Autodial where nn = number of digits up to a maximum of 31 in Autodial DN and x..x = Autodial DN.
	CFW (4)-31	Enter the maximum number of digits in the Call Forward All Calls DN. Note that there is no default value.

	DCFW ll xxx...x	Enter the maximum number of digits in the Default Call Forward DN for a Phantom DN. ll = 4,8,12,16,20,24,28,31 (entries are rounded up to the next valid length.) xx...x = the Default Call Forward All Calls DN.
	ICF (4)-31	Enter the maximum number of digits in the Internal Call Forward DN for a Phantom DN.

LD 11 – For Meridian 1 proprietary sets, configure the expansion pertaining to the Autodial, Call Forward All Calls, Default Call Forward (for Phantom TNs) and Internal Call Forward DNs.

Prompt	Response	Description
REQ:	NEW CHG	Add new data, or change existing data.
TYPE:	xxxx	Type of telephone set. xxxx = SL1, 2006, 2008, 2009, 2016, 2018, 2112, 2116, 2317, 2616, M3000.
TN	l s c u	Terminal Number.
	c u	For Option 11C.
KEY	nn ADL ll xxx...x	Telephone function key assignments. Enter the maximum number of Autodial digits that may be stored. nn = Key number ll = 4,8,12,(16),20,24,28,31,NUL (for M3000 sets, the accepted range is (4)-28) Entries are rounded up to the next valid length. An entry of NUL will disable the Autodial feature xx...x = the Autodial target DN (this is an optional entry.)
	nn CA ll xxx...x	Enter the maximum number of digits that may be stored for the combined Conference-Autodial DN. nn = Key number ll = 4,8,12,(16),20,24,28,31 (entries are rounded up to the next valid length.) xx...x = the Conference-Autodial target DN (this is an optional entry.)

	nn CFW ll xxx...x	Enter the maximum number of digits that may be stored for the Call Forward All Calls DN. nn = Key number ll = (4)-31 (for M2317 and M3000 sets, the accepted range is (4)-23) xx...x = the Call Forward All Calls DN (this is an optional entry.)
	nn ICF ll xx...x	Enter the maximum number of digits that may be stored for the Internal Call Forward DN. nn = Key number ll = (4)-31 xx...x = the Internal Call Forward DN (this is an optional entry.)

LD 12 – For for attendant consoles, configure the expansion pertaining to the maximum length of the Autodial DN.

Prompt	Response	Description
REQ	NEW CHG	Add new data, or change existing data.
TYPE	xxxx	Type of attendant console xxxx = 1250, 2250.
TN	l s c u	Terminal Number.
	c u	For Option 11C.
KEY		Attendant console function key assignments.
	nn ADL xxx...x	Enter the maximum number of Autodial digits that may be stored. nn = Key number xxx...x = the Autodial DN, up to 31 digits (this is an optional entry.)

LD 15 – Configure the expansion pertaining to the Customer Call Forward DN.

Prompt	Response	Description
REQ:	NEW CHG	Add new data, or change existing data.

TYPE:	RDR	Redirection data.
CUST	xx	Customer number.
...		
- CCFWDN	xxx...x X	Enter the Customer Call Forward DN, up to 23 digits (this entry is made for a new CCFWDN, or if the length of an existing CCFWDN has been expanded.) Enter X for no entry.

LD 23 – Configure the expansion pertaining to the ACD Night Call Forward DN and the ACD Interflow DN.

Prompt	**Response**	**Description**
REQ	NEW CHG	Add new data, or change existing data.
TYPE	ACD	Automatic Call Distribution data block.
CUST	xx	Customer number.
ACDN	xxx...x	ACD DN.
...		
NCFW	xxx...x	Enter the ACD Night Forward DN, up to 31 digits (this entry is made for a new Night Forward DN, or if the length of an existing Night Forward DN has been expanded.)
...		
IFDN	xxx...x	Enter the ACD Interflow DN, up to 31 digits (this entry is made for a new Interflow DN, or if the length of an existing Interflow DN has been expanded.)

LD 86 – For the ESN data block, configure the expansion pertaining to the maximum number of Supplemental Digit Restriction and Recognition blocks, and the maximum number of Digit Manipulation tables.

Prompt	Response	Description
REQ	NEW CHG	Add new data, or change existing data.
CUST	xx	Customer number.
FEAT	ESN	ESN data block feature.
...		
MXSD	(0)-1500	Enter the maximum number of Supplemental Digit Restriction and Recognition (SDRR) blocks, for BARS or NARS. Enter 0 (the default) if no SDRR blocks are required.
...		
MXDM	(0)-1000 (0)-256 (0)-32	Enter the maximum number of Digit Manipulation tables. (0)-1000 = for Flexible Numbering Plan (0)-256 = for BARS/NARS (0)-32 = for Coordinated Dialing Plan Enter 0 (the default) if no Digit Manipulation tables are required.

LD 86 – For the Digit Manipulation data block, configure the expansion pertaining to the maximum number of leading digits to be deleted and inserted.

Prompt	Response	Description
REQ	NEW CHG	Add new data, or change existing data.
CUST	xx	Customer number.
FEAT	DGT	Digit Manipulation data block feature.
...		

DMI	1-999 1-255 1-31	Enter the Digit Manipulation table. 1-999 = for Flexible Numbering Plan 1-255 = for BARS/NARS 1-31 = for Coordinated Dialing Plan. The maximum number of Digit Manipulation tables is defined using prompt MXDM, in the ESN data block.
DEL	(0)-19	Enter the number of leading digits to be deleted. Enter 0 (the default) for none.
INST	x...x x...x*y...y X	Enter the number of leading digits to be inserted. x...x = 1-31 x...x*y...y = for Special Common Carriers (SCCs), 1-30, including access number (x...x), delimiter (*), and authorization code (y...y) Enter X for none.

LD 86 – For the Route List data block, configure the expansion pertaining to the minimum Overlap Digit Length.

Prompt	**Response**	**Description**
REQ	NEW CHG	Add new data, or change existing data.
CUST	xx	Customer number.
FEAT	RLB	Route List data block feature.
RLI	0-999	Route List Index.
DMI	1-999 1-255 1-31	Enter the Digit Manipulation table. 1-999 = for Flexible Numbering Plan 1-255 = for BARS/NARS 1-31 = for Coordinated Dialing Plan. The maximum number of Digit Manipulation tables is defined using prompt MXDM, in the ESN data block.

...		
OVLL	(0)-24	Enter the minimum Overlap Digit Length, pertaining to Overlap Sending. If 0 (the default) is entered, then the Flexible Digit Number Length (FLEN) determines whether Overlap Sending takes place.

LD 87 – For a Free Special Number Screening Index, configure the expansion pertaining to the maximum number of Special Numbers to be screened.

Prompt	Response	Description
REQ	NEW CHG	Add new data, or change existing data.
CUST	xx	Customer number.
FEAT	FSNS	Free Special Number Screening.
FSNI	1-255	Free Special Number Screening Index.
SPN	1-19	Special Number to be screened.

LD 87 – For a Trunk Steering Code, configure the expansion pertaining to the maximum number of Flexible Numbers.

Prompt	Response	Description
REQ	NEW CHG	Add new data, or change existing data.
CUST	xx	Customer number.
FEAT	CDP	Coordinated Dialing Plan.
TYPE	TSC	Trunk Steering Code.
TSC	1-7	Trunk Steering Code.
- FLEN	0-24	Flexible Number.

LD 90 – For Network Translation tables, configure the expansion pertaining to the maximum number of Special Numbers digits, the maximum number of digits for Flexible Numbers, the maximum number of Supplemental Digit Restriction and Recognition digits per entry, and the addition of “allow” (ALOW) as a new Supplemental Digit Restriction and Recognition type.

Prompt	Response	Description
REQ	NEW CHG	Add new data, or change existing data.
CUST	xx	Customer number.
FEAT	NET	Network Translation Tables data.
...		
TYPE	SPN	Special Number Translation.
SPN	xxxx xxxx x...x	Enter the Special Number Translation digits. Up to 19 digits may be entered. The SPN digits must be entered in groups of at most four digits, separated by a space. Up to five groups can be entered. The restriction of allowing one less digit if the first digit of a digit string is not “1”, is removed.
- FLEN	(0)-24	Enter the number of Flexible Digits (the number of digits that the system expects to receive before accessing a trunk, and outpulsing the digits.)
...		
- SDRR	 DENY LDID LDDD DID DDD ITED ARRN STRK ALOW	Type of Supplemental Digit Restriction and Recognition. Restricted codes. Recognized local DID codes. Recognized local DDD codes. Recognize remote DID codes. Recognize remote DDD codes. Incoming trunk group exclusion digits. Alternate routing remote number. Allowed codes for ADM/MDM. Allowed codes.

		The maximum number of digits entered in response to the DENY, LDID, LDDD, DID, DDD and ALOW prompts, which follow, must be less than 10, or 7-m (8-m for 1+ dialing) for Central Office translation data (NXX), 10-m (11-m for 1= dialing) for Numbering Plan Area Code translation data (NPA), or 19-m for Special Numbers Translation data (SPN), where m = the number of digits entered for the prompt NXX, NPA or SPN. These numbers are no longer required to be leftwise unique. For non leftwise unique numbers, the longer number takes precedence over the shorter number. However, the exact same numbers (non leftwise unique and the same length) are still blocked.
- - DENY	x...x	Restricted number to be denied.
- - LDID	x...x	Local DID number to be recognized.
- - LDDD	x...x	Local DDD number to be recognized.
- - DID	x...x	Remote DID number to be recognized.
- - DDD	x...x	Remote DDD number to be recognized.
- - ALOW	x...x	Code to be allowed.

Feature operation

There are no operating procedures specified for this feature.

Electronic Lock Network Wide/Electronic Lock on Private Lines

Contents

The following are the topics in this section:

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Controlled Network Class of Service 611

Feature description

The basic Electronic Lock feature has been enhanced to provide the following capabilities:

- The feature can be implemented network wide.
- The capability to define (for the locked sets), on a per customer basis, a Controlled Network Class of Service (CNCS) different from the Network Class of Service (NCOS), which is defined on a per set basis.
- Locking can be implemented for Private DNs.

In a Meridian Customer Defined Network (MCDN) environment, Electronic Lock Network Wide can be used to change the Class of Service of a set in a remote location. Electronic Lock Network Wide is activated or deactivated from any node by dialing the Electronic Lock Flexible Feature Code (FFC), the password, and the DN of the set to be changed. Since the password length defined at the destination node is not known at the originating node, the Station Control Password (SCPW) length (defined in LD 15) must be defined the same for all network nodes.

If the originating node has the FFC Confirmation Tone option selected, a confirmation tone is given when the feature is successfully activated or deactivated. Overflow tone is given if the operation is unsuccessful. There is no FFC verify code for Electronic Lock.

When a locked set makes an outgoing trunk call, and Controlled Network Class of Service is defined, the Network Class of Service (NCOS) defined by CNCS is used instead of the NCOS defined in LD 10 or 11 for the set. If network signaling is configured for the trunk that normally transmits the NCOS of the set between Electronic Switched Network (ESN) nodes, the CNCS is transmitted instead of the NCOS. This prevents a locked set from reaching the exchange network by tandeming through a TIE trunk using ESN.

A prompt (PELK) is introduced in the Customer Data Block to implement Electronic Lock on private lines. If this option is enabled, an outgoing call on a private line of a locked set is subject to the same restrictions as all other DNs on the set. The same intercept treatment would be given as for a regular DN. The restrictions for private lines, as well as other DN keys on the set, are controlled by the Controlled Class of Service (CCOS), and by the CNCS if defined. Therefore, for outgoing calls, the Class of Service restrictions and/or New Flexible Code Restriction (NFCR) apply to private line keys on locked sets. Only outgoing calls are affected. The Class of Service of a non-locked set has no affect on private lines.

Operating parameters

The Network Dialing Plan must be either a Coordinated Dialing Plan (CDP) or a Uniform Dialing Plan (UDP).

The set password lengths must be equal for all nodes in the network.

Network wide operation is only supported through an MCDN ISDN network.

The Electronic Lock feature must be equipped on both originating and remote nodes.

The FFC used is defined on the node from which Network Electronic Lock is being activated. To activate or deactivate Network Electronic Lock from any remote node, the user has to use the FFC Electronic Lock Activate (ELKA) or Electronic Lock Deactivate (ELKD) code defined on that remote node.

ISDN Basic Rate Interface (BRI) sets cannot be used to lock another set, nor can they be locked themselves.

An analog (2500/500 type) set with a private line DN or a Meridian digital sets set with a private line on the Prime DN cannot be locked.

The following hardware is required:

- Primary Rate Interface – D-channel Handler Interface (DCHI)/ Multipurpose Serial Data Link (MSDL) and PRI2 cards.
- Integrated Services Digital Network Signaling Link (ISL) – DCHI cards and TIE trunks.
- Virtual Network Services (VNS) – DCHI cards and any trunks.

Feature interactions

Automatic Call Distribution (ACD)

An ACD set cannot be locked.

Call Forward (CFW)
Call Forward No Answer (CFNA)

For Call Forwarding, the COS and NCOS used for the forwarding call can be taken from either the forwarding set or from the forwarded set, depending on the option defined in the Customer Data Block.

For example, set B call forwards all calls to an external trunk. Set A calls set B. If OPT = CFF in LD 15 (Call Forward forwarded to party's COS and NCOS), the COS and NCOS of set B are used for forwarding the call to the trunk. If OPT = CFO (Call Forward originating party's COS and NCOS), the COS and NCOS of set A are used for forwarding the call to the trunk.

Direct Inward System Access (DISA)

The Electronic Lock feature cannot be activated or deactivated when accessing the node through DISA.

Digital Private Network Signaling System (DPNSS1)
Digital Access Signaling System (DASS2)
Analog Private Network Signaling System (APNSS)

Electronic Lock Network Wide is not supported on DPNSS1, DASS2, or APNSS trunks.

Electronic Switched Network Authcode

If a station user enters an authcode on the set, regardless of the status of the set being locked or not, the NCOS defined for the authcode is used. The ESN Authcode feature overrides the Electronic Lock Network Wide feature.

Flexible Numbering Plan

If a network is equipped with a flexible numbering plan (i.e., not all the network DNs are the same length), hanging up before the usual end-of-dialing timeout cancels the request for activation or deactivation of Electronic Lock. Dialing an octothorpe (#) after the network DN will cause the request for activation or deactivation of the Electronic Lock to be sent immediately, instead of waiting for the usual end-of-dialing timeout to send it.

Multiple Appearance DN

The same locked or unlocked state applies to all Terminal Numbers with the same primary DN and the same SCPW. Terminal Numbers with the same DN, but not having the same SCPW, cannot be locked or unlocked.

New Flexible Code Restriction (NFCR)

With NFCR, toll denied stations are allowed or denied calling privileges according to the Facility Restriction Level (FRL) assigned to the NCOS defined in the protected line block. For a locked set, NFCR uses the FRL assigned to the CNCS to determine its calling privileges if one is defined; if no CNCS is defined, the NCOS of the locked set will be used.

Scheduled Access Restrictions (SAR)

The SAR feature overrides Electronic Lock.

Virtual Network Services (VNS)

Electronic Lock may function in a VNS environment.

Feature packaging

Electronic Lock Network Wide/Electronic Lock on Private Lines is packaged under Flexible Feature Codes (FFC) package 139, and it has the following dependencies:

- Network Class of Service (NCOS) package 32;
- Controlled Class of Service (CCOS) package 81; and
- Integrated Services Digital Network (ISDN) package 145.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 15 – Modify the Customer Data Block for Controlled Class of Service data.

2 LD 15 – Modify the Customer Data Block for Flexible Feature Code data.

3 LD 10 – Set the Station Control Password and Controlled Class of Service Allowed for each analog (500/2500 type) telephone.

4 LD 11 – Set the Station Control Password and Controlled Class of Service Allowed for each Meridian 1 proprietary telephone.

5 LD 57 – Configure the Flexible Feature Codes for Electronic Lock.

6 LD 87 – In the ESN 2 overlay, define all NCOS to be used.

7 LD 15 – Modify the Customer Data Block for Controlled Class of Service data.

8 LD 15 – Modify the Customer Data Block for Flexible Feature Code data.

9 LD 16 – Set the Facility Restriction Level (FRL) number and the New Flexible Code Restriction (NFCR) tree number for private lines.

10 LD 10 – Set the Station Control Password and Controlled Class of Service Allowed for each analog (500/2500 type) telephone.

11 LD 11 – Set the Station Control Password and Controlled Class of Service Allowed for each Meridian 1 proprietary telephone.

Electronic Lock Network Wide

Use the following overlays to implement Electronic Lock Network Wide.

LD 15 – Modify the Customer Data Block for Controlled Class of Service data.

Prompt	Response	Description
REQ:	CHG	Change existing data block.
TYPE:	CCS	Controlled Class of Service data.
CUST	xx	Customer number.
- CCRS	aaa	Controlled Class of Service (CCOS) Restricted Service.
- ECC1	aaa	Enhanced Controlled Class of Service level 1.
- ECC2	aaa	Enhanced Controlled Class of Service level 2.
- CNCS	0-99	Network Controlled Class Of Service for Electronic Lock.
- PELK	YES	Electronic Lock on Private Lines.

LD 15 – Modify the Customer Data Block for Flexible Feature Code data.

Prompt	Response	Description
REQ:	CHG	Change existing data block.
TYPE:	FFC	Flexible Feature Code data.
CUST	xx	Customer number.
- CCRS	aaa	Controlled Class of Service (CCOS) Restricted Service.
- SBUP	(YES) NO	Enable use of station control passwords for set based administration user level access

- - PWD2	xxxx	PWD2 password for confirmation
- FFCS	(NO) YES	Change Flexible Feature Code end-of-dialing indicator
- - STRL	1-3	String Length of end-of-dial indicator
- - STRG	xxx	String to indicate end-of-dialing
- ADLD	(0)-20	Auto Dial Delay in seconds
- SCPL	0-8	Station Control Password Length

LD 10 – Set the Station Control Password and Controlled Class of Service Allowed for each analog (500/2500 type) telephone.

Prompt	Response	Description
REQ:	NEW,CHG	Add, Change.
TYPE:	500	Telephone type.
CUST	xx	Customer Number.
TN	l s c u	Terminal number.
	c u	For Option 11C.
SCPW	xxxxxxxx	Station Control Password (1 to 8 digits, as defined in LD 15).
CLS	CCSA	Controlled Class of Service Allowed.

LD 11 – Set the Station Control Password and Controlled Class of Service Allowed for each Meridian 1 proprietary telephone.

Prompt	Response	Description
REQ:	NEW CHG	Add, Change.
TYPE:	aaaa	Telephone type, where aaaa = SL1, 2006, 2008, 2009, 2016, 2018, 2112, 2216, 2317, 2616, or 3000.
CUST	xx	Customer Number.

TN	l s c u	Terminal number.
	c u	For Option 11C.
SCPW	xxxxxxxx	Station Control Password (1 to 8 digits, as defined in LD 15).
CLS	CCSA	Controlled Class of Service Allowed.

LD 57 – Configure the Flexible Feature Codes for Electronic Lock.

Prompt	Response	Description
REQ	NEW CHG	New, or change.
TYPE	FFC	Flexible Feature Codes.
CUST	xx	Customer Number.
FFCT	YES	Provide FFC confirmation tone.
CODE	ELKA	New/change Electronic Lock Activate FFC.
ELKA	xxxx	Enter the new or changed Electronic Lock Activate FFC
CODE	ELKD	New/change Electronic Lock Deactivate FFC.
ELKD	xxxx	Enter the new or changed Electronic Lock Deactivate FFC

LD 87 – In the ESN 2 overlay, define all NCOS to be used.

Prompt	Response	Description
REQ	NEW CHG	Enter new/change data.
CUST	xx	Customer Number.
FEAT	NCTL	Network Control.
...		
NRNG	0-99	NCOS range.

NCOS	0-99	Network Class of Service group number.
...		
– FRL	(0)-7	Facility Restriction level.

Electronic Lock on Private Lines

Use the following overlays to implement Electronic Lock Network on Private Lines.

LD 15 – Modify the Customer Data Block for Controlled Class of Service data.

Prompt	Response	Description
REQ:	CHG	Change existing data block.
TYPE:	CCS	Controlled Class of Service data.
CUST	xx	Customer number.
- CCRS	aaa	Controlled Class of Service (CCOS) Restricted Service.
- ECC1	aaa	Enhanced Controlled Class of Service level 1.
- ECC2	aaa	Enhanced Controlled Class of Service level 2.
- CNCS	0-99	Network Controlled Class Of Service for Electronic Lock.
- PELK	YES	Electronic Lock on Private Lines.

LD 15 – Modify the Customer Data Block for Flexible Feature Code data.

Prompt	Response	Description
REQ:	CHG	Change existing data block.
TYPE:	FFC	Flexible Feature Code data.
CUST	xx	Customer number.
- CCRS	aaa	Controlled Class of Service (CCOS) Restricted Service.

- SCPL	0-8	Station Control Password Length.
- SBUP	(YES) NO	Enable use of station control passwords for set based administration user level access
- - PWD2	xxxx	PWD2 password for confirmation
- FFCS	(NO) YES	Change Flexible Feature Code end-of-dialing indicator
- - STRL	1-3	String Length of end-of-dial indicator
- - STRG	xxx	String to indicate end-of-dialing
- ADLD	(0)-20	Auto Dial Delay in seconds
- SCPL	0-8	Station Control Password Length

LD 16 – Set the Facility Restriction Level (FRL) number and the New Flexible Code Restriction (NFCR) tree number for private lines.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	RDB	Route Data Block.
...		
PRIV	YES	Private Line Route.
...		
FRL	0-7 0-254	Facility Restriction Level (FRL) and New Flexible Code Restriction (NFCR) tree number.

LD 10 – Set the Station Control Password and Controlled Class of Service Allowed for each analog (500/2500 type) telephone.

Prompt	Response	Description
REQ:	NEW CHG	Add, Change.

TYPE:	500	Telephone type.
CUST	0-99	Customer number.
TN	l s c u	Terminal number.
	c u	For Option 11C.
SCPW	xxxxxxxx	Station Control Password (1 to 8 digits, as defined in LD 15).
CLS	CCSA	Controlled Class of Service Allowed.

LD 11 – Set the Station Control Password and Controlled Class of Service Allowed for each Meridian 1 proprietary telephone.

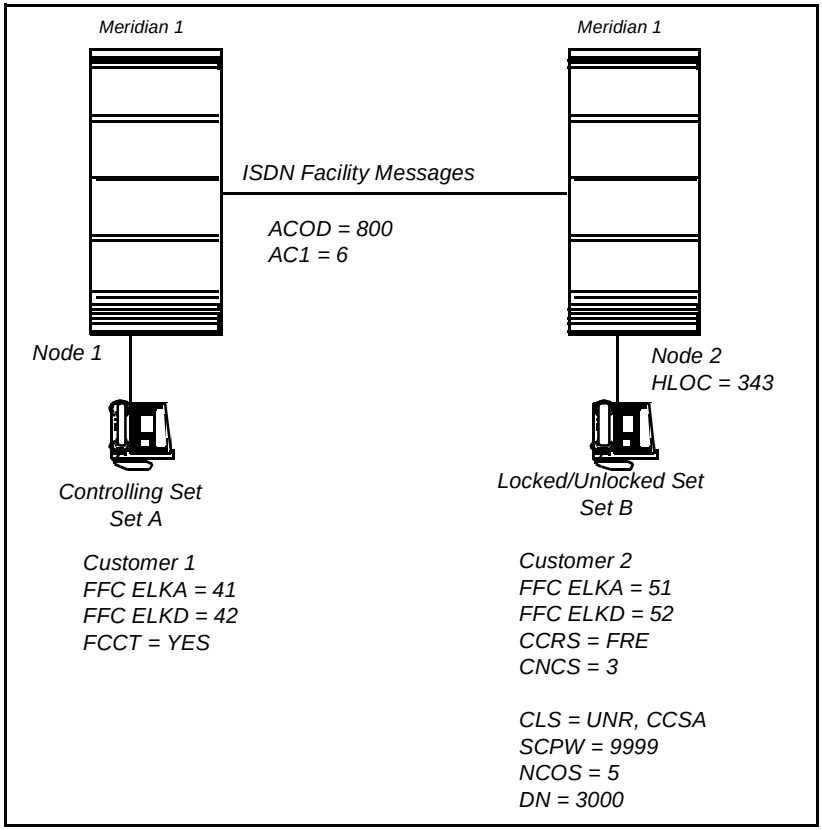
Prompt	**Response**	**Description**
REQ:	NEW CHG	Add, or change.
TYPE:	aaaa	Telephone type, where aaaa = SL1, 2006, 2008, 2009, 2016, 2018, 2112, 2216, 2317, 2616, or 3000.
CUST	xx	Customer number.
TN	l s c u	Terminal number.
	c u	For Option 11C.
SCPW	xxxxxxxx	Station Control Password (1 to 8 digits, as defined in LD 15).
CLS	CCSA	Controlled Class of Service Allowed.
...		
KEY	xx PVR yyyy(yyy)	Key number and DN for Private Line Ringing, where xx = the key number and yyyy(yyy) = the Private Line Ringing DN (up to four digits; up to seven digits if the Directory Number Expansion (DNXP) package 150 is equipped). Private Line Directory Number (PRDN) must be defined in LD 14.

Feature operation

Electronic Lock Network Wide

In this example, an MCDN ISDN network is set up connecting Node 1 to Node 2. Set A is the Controlling set. Set B is the set to be locked and unlocked by Set A. The digits that set A would dial to ring set B are to be in the format of a CDP or UDP dialing plan. This is standard dialing for ISDN features.

Figure 60
Network Electronic Lock



To lock set B (in Node 2) from set A (in Node 1), the user goes off-hook and dials the Electronic Lock Activate (ELKA) FFC defined in the Customer Data Block of Node 1, followed by the Station Password (SCPW) defined for set B, and the digits that set A would normally dial to ring set B (e.g., 41 + 9999 + 6-343-3000). If the FFCT option is configured as YES in LD 57 in the Customer Data Block of Node 1, confirmation tone is given to set A to confirm that the lock operation has been successful. Set B becomes locked if it was previously in an unlocked state.

If Set B was already locked, the above operation is ignored and Set B remains locked; however, a confirmation tone is provided to verify that the set is locked.

If the lock operation was unsuccessful, overflow tone is given.

To unlock set B (in Node 2) from set A (in Node 1), the user goes off-hook and dials the Electronic Lock Deactivate (ELKD) FFC defined in the Customer Data Block of Node 1, followed by the SCPW defined for set B and the digits that set A would normally dial to ring set B (e.g., 42 + 9999+ 6-343-3000). If the FFCT option is configured as YES in LD 57 in the Customer Data Block of Node 1, confirmation tone is given to set A to confirm that the unlock operation has been successful. Set B becomes unlocked if it was previously in a locked state.

If Set B was already unlocked, the above operation is ignored and Station B remains unlocked; however, a confirmation tone is provided to verify that the set is unlocked.

If the unlock operation was unsuccessful, overflow tone is given.

Electronic Lock on Private Lines

Feature operation of Electronic Lock for Private Lines is the same as for the basic Electronic Lock feature.

Controlled Network Class of Service

No specific operating instructions are required to use Controlled Network Class of Service.

Electronic Switched Network Compatibility on ISDN

Contents list

The following are the topics in this section:

Feature description 613
Operating parameters 616
Feature interactions 616
Feature packaging 616
Feature implementation 616
Feature operation 616

Feature description

The Electronic Switched Network (ESN) group of features is designed to support voice and circuit-switched voiceband data telecommunications needs for multiple-location customer applications.

> ***Note:*** ESN is supported for connections from Meridian 1 to Meridian 1, to SL-100, and to DMS-100 Centrex.

Electronic Switched Network (ESN) applications range from a single network node (combined PBX and network switching system) to a widely dispersed network with up to 256 locations. For complete information on Electronic Switched Network (ESN), refer to the *Meridian networking feature* document and *Electronic Switched Network description*.

ISDN enhances Electronic Switched Network (ESN), by allowing ESN capabilities such as Network Class of Service, Network Alternate Route Selection, ESN queuing, and Network Authorization Codes across a Meridian 1 ISDN network.

ISDN provides a series of messages containing imbedded information; for example, NCOS information is imbedded in the SETUP message to provide the means to control a user's eligibility to:

- access routes
- access queuing
- receive Expensive Route Warning Tone (ERWT)
- access network speed call

Table 50 provides a list of ESN features and capabilities that may be configured on ISDN.

Table 50
ESN features available with ISDN (Part 1 of 2)

ESN features	Available on ISDN?
Network Class of Service	yes
Network Control	yes
—NCOS	yes
—TCOS (ETN)	yes

Table 50
ESN features available with ISDN (Part 2 of 2)

ESN features	Available on ISDN?
Network Alternate Route Selection	
—NARS Access Codes	yes
—Uniform Dialing Plan	yes
—Time of Day Routing	yes
—Network Routing Control	yes
—Satellite Link Control	yes
—Digit Screening	yes
—Digit Manipulation	yes
—Auto on-net to offnet overflow	yes
—Automatic Least Cost Routing	yes
—Network Speed Call	yes
—Automatic OCC Access	yes
—Expensive Route Warning Tone	yes
—Trunk Route Optimization	yes
ESN Queuing	
Local queuing	
—Offhook queuing	yes
—Call-back queuing	yes
Network Queuing	
—Coordinated Call-Back Queuing	no
—Coordinated Call Back Queuing to conventional main	no
—Remote Virtual Queuing	yes
Network Authorization Codes	yes
Coordinated Dialing Plan for 10 digits	yes
Flexible Numbering Plan	yes
ESN Network Call Transfer	no

Operating parameters

There are no operating parameters associated with this feature

Feature interactions

There are no feature interactions associated with this feature.

Feature packaging

This feature is included in base Meridian 1 System Software.

Feature implementation

There are no specific implementation procedures for this feature.

Feature operation

No specific operating procedures are required to use this feature.

Electronic Switched Network interworking

Contents

The following are the topics in this section:

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Operating parameters 619
Feature interactions 619
Feature packaging 619
Feature implementation 619
Task summary list 619
ESN default call types 619
ESN access code insertion 621
Private Network Hopoff 622
Private Network Overflow 623
Feature operation 624

Feature description

The Electronic Switched Network (ESN) operates within ISDN, supporting Network Class of Service (NCOS) capability. The tables in this module describe which ESN features are available over ISDN and illustrate ESN capabilities over ISDN.

Network Class Of Service (NCOS) information is embedded in SETUP messages, and provides the means to control a user's eligibility for the following:

- access routes

- access queuing
- receive Expensive Route Warning Tone (ERWT)
- access network speed call

When NCOS information, which includes Traveling Class of Service (TCOS) information, is sent to a DMS-100, the DMS switch can provide access to AT&Ts Electronic Tandem Network (ETN).

ESN translation

Currently, a Meridian 1 switch with a BARS or NARS package can have two (or one) separate ESN translators for handling BARS/NARS calls. NARS can have two translators and BARS can have only one translator (AC1). This is in addition to its standard translator, which handles all other call types. Each NARS/BARS translator has its access code (ESN AC1/AC2), which is defined on the standard translator. The remaining digits, for example, NPA, NXX, LOC, and SPN, are defined on the NARS/BARS translator.

Therefore, a receiving switch must determine which translator to use and insert the needed NARS/BARS access code (unless the receiving number is complete, that is, it includes the proper NARS/BARS access code in its digit stream already). This can be done by configuring an ESN digit manipulation to insert the ESN access code in the sending switch.

To insert the needed BARS/NARS access code in the receiving switch, two route options in LD 16 can be used:

- INST: An incoming route option that inserts the specified digits(s) to the incoming digit stream for all the calls received on that route.
- INAC: An incoming ISDN route option that inserts the needed NARS/BARS access code to the incoming digit stream. The insertion is based on the Type of Number of the received Called Number Information Element, bypassing the digit insertion (INST) of the route. The AC2 option in LD 15 provides a mapping between the incoming Type of Number and the desired translator. This is used to determine which NARS/BARS access code is inserted.

ESN access code configuration with package 148

For Meridian 1 configurations that utilize ISDN networking features, ESN access code insertion must be performed on the receiving Meridian 1. The originating Meridian 1 must not use digit manipulation to insert and send the ESN access code to the terminating Meridian 1.

Therefore, in order to accomplish networking feature transparency (requiring package 148), the ESN access code insertion must be performed in the receiving Meridian 1, by means of the INAC prompt in LD 16. Although the INST or the INAC prompt can be used, the INAC prompt is the recommended method.

When the PBX is upgraded, the above database conversion is required to allow networking applications (such as NRAG) to function properly.

Operating parameters

There are no operating parameters associated with this feature.

Feature interactions

There are no feature interactions associated with this feature.

Feature packaging

This feature is included in base X11 System Software.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 86 – Configure digit manipulation.

2 LD 16 – Enable the INAC option.

3 LD 15 – Map the NARS/BARS access code to the incoming call types.

ESN default call types

When an ISDN call is made, a default Electronic Switched Network (ESN) call type is set initially. The call type is set depending on the dialing method used (that is, how the call is made). Table 51 shows the ISDN default call types. Procedure 1 describes how to define the default call types.

Note: When a trunk access code is used to dial on an ISDN route, the caller dials all digits without waiting for subsequent dial tones.

Table 51
Default Call Types

Dial method	Default call type	Comment
Direct dial	UKWN (unknown)	Direct dial to trunks via access code
CDP (DSC/TSC)	CDP (Coordinated dialing plan)	Dial CDP number via DSC/TSC code
CDP (LSC)	UKWN	Dial CDP number via LSC code
ESN (LOC)	LOC (location code)	Dial NARS location code
ESN (HLOC)	UKWN	Dial ESN HLOC number
ESN (NPA)	NPA (national)	Dial ESN NPA number
ESN (NXX)	NXX (local)	Dial ESN NXX number
ESN (SPN)	SPN (special number)	Dial ESN SPN number

LD 86 – Configure digit manipulation.

Prompt	Response	Description
REQ	NEW CHG	Add new data or change existing data.
CUST	xx	Enter customer number
FEAT	DGT	Digit manipulation data block
DMI	1–255	Digit manipulation table index numbers for NARS/BARS
CTYP		Call type. Enter the call type to the manipulated digits. This call type must be recognized by the far end switch.
	(NCHG)	The call type will not be changed
	INTL	Special number in international format

Prompt	Response	Description
	NPA	NPA
	NXX	NXX
	LOC	Location Code
	CDP	Coordinated Dialing Plan
	SPN	Special number
	UKWN	Unknown call type

ESN access code insertion

Procedure 2 and Procedure 3 describe how to automatically insert the needed NARS/BARS access code to the incoming digit stream. This is required for ISDN networking features such as Network Ring Again (NRAG) and Network Message Services (NMS).

ESN access code insertion is performed in the receiving switch either by the INST or INAC option in LD 16. The INAC option is recommended. In other words, the called number may go through ESN digit manipulation, which must not include the ESN access code in the sending switch.

LD 16 – Enable the INAC option.

Prompt	Response	Description
REQ	NEW CHG	Add or change data.
TYPE	RDB	Route data block
INAC	(NO) YES	Insert Access Code. Permit an ESN access code to be automatically added to an incoming ESN call from a private network. If INAC is YES, the digit insertion option (INST) is bypassed. This prompt only appears if the route type is a tie trunk.

LD 15 – Map the NARS/BARS access code to the incoming call types.

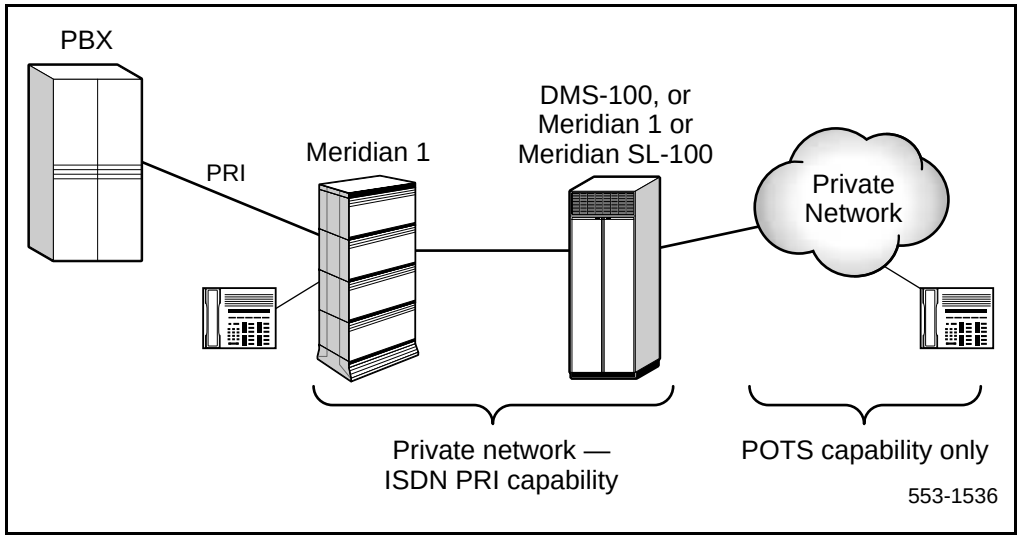
Prompt	Response	Description
REQ	NEW CHG	Add or change data.
TYPE	NET	Networking data.
AC2		Access code 2. Enter call types (type of number) that use access code 2. Multiple responses are permitted. If a call type is not entered here, it is automatically defaulted to access code 1.
	NPA	E.164 National
	NXX	E.164 Subscriber
	INTL	International
	SPN	Special number
	LOC	Location code
ISDN	YES	
PNI	1–32700	Customer private identifier—unique to a customer. Within one network, use the same value for PNI in both the Customer Data Block (LD 15) and the Route Data Block (LD 16). For different customers, the PNI in LD 15 should match the PNI in LD 16 at the far end switch (M1/SL-1 only).

Private Network Hopoff

Private Network Hopoff is provided by the ESN feature. Private Network Hopoff allows ISDN callers to use the private network to complete public calls. The call is routed through the private network as far as possible before "hopping off" onto the public lines (see Figure 61).

Users select this service, on a per call basis, by dialing the private network facilities prefix digit, followed by the public network number. For example, the number 9 is often used as a private network facilities prefix digit before dialing a local number.

Figure 61
Private Network Hopoff

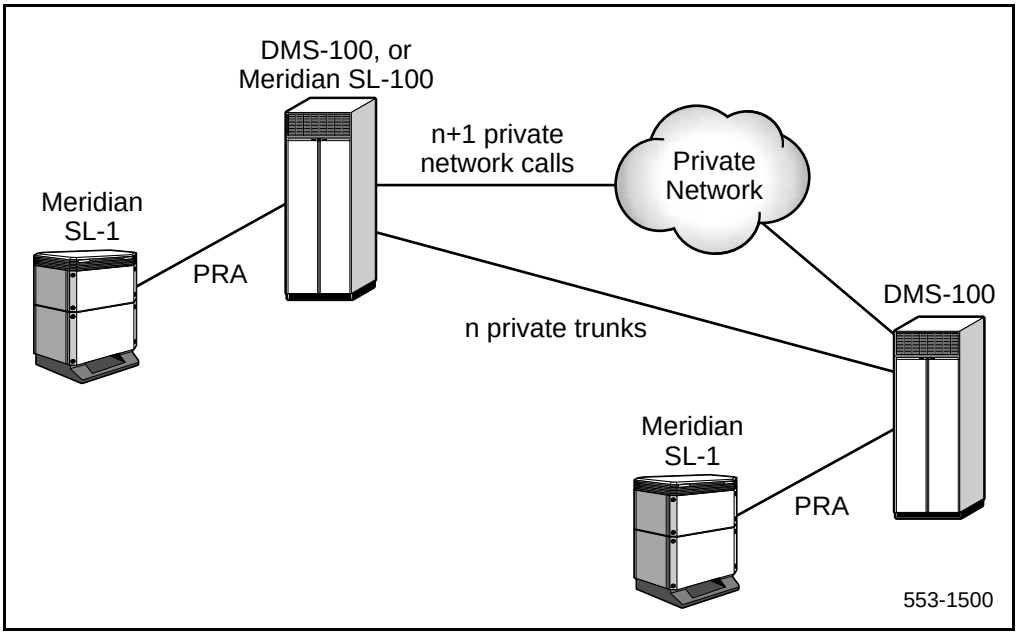


Private Network Overflow

This service allows overflow from a private network onto public network facilities (see Figure 62). On outgoing calls over a DMS-100 PRI connection, the DMS provides network overflow when all of a customer's private trunks are busy.

For outgoing calls that encounter blocking (all B-channels are busy), the network provides the capability to overflow to alternate trunks. This is provided by the Electronic Switched Network (ESN) feature. This access can be restricted using a trunk or set class of service.

Figure 62
Private Network Overflow



Feature operation

No specific operating procedures are required to use this feature.

Emergency Services Access

Emergency Services Access (ESA) feature places a customer in compliance with new federal legislation that requires the Private 911 type of functionality provided by ESA. Please note, however, that the ESA feature is also generally useful for users who are not subject to legislation, and is broad enough to be used in different countries.

For example, it will be appreciated by any customer who wants to route emergency calls in a special manner, or who wants to be notified when a telephone user makes an emergency call. It would also appeal to a customer who wishes to have ESA calls answered on-site, on the business premises, rather than being forwarded to the Public Services Answering Point (PSAP).

For complete information on ESA, please refer to *Emergency Services Access: Product Description and Administration* (553-3001-313).

Equi-distribution Routing Network Attendant Service

Contents

The following are the topics in this section:

Feature description 627
Operating parameters 628
Feature interactions 628
Feature packaging 628
Feature implementation 629
Task summary list 629
Feature operation 630

Feature description

This feature provides a new algorithm for Network Attendant Service (NAS) routing. The algorithm attempts to distribute routed calls evenly among network attendants, based on loading levels. Calls are routed across a network according to NAS routing tables. These tables define the primary attendant node and alternatives in case the attendant at the primary node is busy and the call waiting threshold has been exceeded. In the case of all attendants busy, as routing is attempted to each alternate defined in the NAS routing table, the Equi-distribution NAS Routing feature reads the load level at each location. The call is then routed to the alternate with the lowest load level.

The load level is a value defined as the customer-defined efficiency factor, multiplied by the number of calls waiting for an attendant, divided by the number of attendants in service. The efficiency factor is a value between 0-8064. The lower the efficiency factor, the more efficient the attendants are considered to be at a specific location (however, if a value of 0 is entered, then the Equi-distribution NAS Routing feature is not activated, and normal NAS routing occurs).

Another capability of the Equi-distribution NAS Routing feature deals with an attendant at a node going into Night Service. All calls in the attendant queue are routed to another location, based on the NAS routing schedule, instead of to the local night DN.

Operating parameters

This feature applies only to Meridian 1 systems using Meridian Customer Defined Networking (MCDN) signaling over Integrated Services Digital Network Signaling Link (ISL)/ISDN TIE links.

All nodes in the Meridian 1 network should have Equi-distribution NAS Routing feature.

This feature may not be compatible with the Console Presentation Group (CPG) or Network Tenant Service (NTS) features.

Feature functionality takes into account a maximum number of four alternate locations per time period.

Feature interactions

When the attendant goes into Night Service, calls presented to the attendant receive NAS routing in an attempt to reach another attendant that is in day service, rather than being routed to the local night DN.

Feature packaging

The following packages are required for Equi-distribution Routing, Network Attendant Service:

- Network Alternate Route Selection (NARS) package 58;

- Integrated Services Digital Network Signaling (ISDN) package 145, or ISDN Signaling Link (ISL) package 147; and
- Network Attendant Service (NAS) package 159.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 15 – Configure the EFLL in LD 15.

2 LD 86 – Define the attendant alternatives for NAS routing in the Electronic Switched Network.

3 LD 93 – Configure the EFLL in LD 93.

LD 15 – Configure the EFLL in LD 15.

Prompt	Response	Description
REQ:	CHG	Change.
TYPE:	ATT	Attendant Console options.
CUST	xx	Customer number.
...		
EFLL	(0)-8064	Efficiency Factor Loading Level. The efficiency factor loading level. If the default value of 0 is entered, then the Equi-distribution NAS Routing feature is not activated, and normal NAS routing occurs.

LD 86 – Define the attendant alternatives for NAS routing in the Electronic Switched Network.

Prompt	Response	Description
REQ	CHG	Change.
CUST	xx	Customer number.
FEAT	NAS	Feature = NAS (Network Attendant Service).
...		

ALST	1-7	Alternatives List.Attendant alternatives for NAS routing (up to 4 alternatives may be defined for each schedule period).
DBK	(N) Y	Drop Back busy option. YES = Drop Back Busy allowed, NO = Drop Back Busy denied.

LD 93 – Configure the EFLL in LD 93.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	aaa	Type of data block.
CUST	xx	Customer number
...		
EFLL	(0)-8064	Efficiency Factor Loading Level. The efficiency factor loading level. If the default value of 0 is entered, then the Equi-distribution NAS Routing feature is not activated, and normal NAS routing occurs.

Feature operation

No specific operating procedures are required to use this feature.

Error Handling on ISDN Signaling Link Analog E&M TIE Trunks

Contents

The following are the topics in this section:

Feature description 631
Operating parameters 632
Feature interactions 632
Feature packaging 632
Feature implementation 633
Task summary list 633
Feature operation 633

Feature description

The Integrated Services Digital Network Signaling Link (ISL) Analog E&M TIE Trunks feature identifies error conditions that are generated by external equipment and ensures that faulty trunks cannot be used. When the error condition is removed, the trunk is put back into service.

When an error condition is identified while the trunk is idle, the trunk is put into a maintenance busy mode and a trunk error message is printed. If an error occurs while a call is being sent, an error message is printed and the call proceeds; the trunk unit is put into maintenance busy mode after the call is disconnected. Outgoing calls cannot be made on units that are in maintenance busy and incoming calls are rejected.

Once the external equipment removes the error condition, a message is printed and a restart message is sent on the D-channel to indicate that the unit is usable.

Operating parameters

Error Handling on ISL Analog E&M TIE Trunks only functions on ISL Analog E&M TIE Trunks and not on other types of ISL TIE trunks. This function only operates when the D-channel is established.

E&M types applicable to this feature include two-wire and four-wire with TY1, TY2 and British Post Office E&M signaling types. The feature applies to immediate start, delay dial start and wink start arrangement types.

This feature is designed to operate only when ISL E&M TIE trunks are used in conjunction with transmission equipment.

To implement Error Handling on ISL Analog E&M TIE trunks the FALT prompt response in the Route Data Block (LD 16) must be YES. If FALT=NO, then no error handling will occur on the route.

Error handling exists on ISDN Signaling Link Digital Trunk Interface (2Mbit).

Feature interactions

There are no feature interactions specified for this feature.

Feature packaging

The following package is required for Error Handling on ISL Analog E&M Tie Trunks:

- ISDN Signaling Link (ISL) package 147 which is dependent on ISDN Signaling (ISDN) package 145.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 16 – Configure ISL on Analog Trunks.2

LD 16 – Configure ISL on Analog Trunks.

Prompt	Response	Description
REQ	NEW CHG	Add, or change.
TYPE	RDB	Route data block.
...		
DTRK	NO	Digital trunk route.
ISDN	YES	ISDN Primary Rate Interface option.
MODE	ISLD	Mode of D-channel controlling the route.
...		
FALT	YES	Enables the error handling and recognition of E lead error for ISL E&M Tie Trunks. If FALT= NO, then no error handling with occur.

Feature operation

Overlay Changes

The enabling/disabling commands in the maintenance overlay is changed so that if the trunk unit is in error state the following occurs:

- The trunk unit cannot be enabled until the external error condition is removed. The message TRK533 is printed to warn the user that the enable command is cancelled because an error exists on the ISL E&M TIE Trunks. When this occurs, the trunk unit will remain in maintenance busy mode.

These overlay changes ensure that error states on both sides of the link are not affected by enabling/disabling the unit.

Error Applied to Unit

- An error condition can be generated by the external equipment when a unit is idle, during call setup or when a call is established.

Error applied, Unit Idle

- If an error is detected the unit is put in maintenance busy mode and the error message TRK531 is printed.

Error applied, Call Setup

- If an error is detected during call setup the error message TRK531 is printed.
- After the call is disconnected, the trunk is put into maintenance busy mode.

Error applied, Call Established

When an error is applied while a call is established, it is detected after the call is disconnected. If the release message is not received within the time defined by the supervision timer then the E lead remains grounded and causes an error condition. The following occurs:

- The unit is put into maintenance busy mode and the error message TRK531 is printed.

Error State

When the unit is an error state then it is not available for incoming or outgoing calls. The error state is maintained until it is cleared by external equipment.

Outgoing Calls

Normal call processing selects the next available channel for outgoing calls.

Incoming Calls

Far end attempts to make calls will send a SETUP message. If the unit is in an error state, a Release Complete message is sent. The far end trunk will be put into a LOCKOUT state.

Restart Message

During an error state, a RESTART message is received from the far end. This message is ignored so that the error state of the unit is preserved.

Error Removed

If the error condition is removed by external equipment, the trunk is marked IDLE, the error message TRK532 is printed and a RESTART One Channel message is sent on the D-channel. The far end trunk unit changes from LOCKOUT to IDLE state.

No specific operating procedures are required to use this feature, however the following system messages will occur throughout feature operation.

Message Number	Events
TRK531 tn	An error has been detected on ISL E&M TIE, unit will be put to Maintenance Busy.
TRK532 tn	Error Condition on ISL E&M TIE removed.
TRK533 tn	Enable command is cancelled on this unit because an error exists on the ISL E&M TIE trunks.

EuroISDN 7kHz/Videotelephony Teleservices

Contents

The following are the topics in this section:

Feature description 637
Operating parameters 639
Feature interactions 640
Feature packaging 642
Feature implementation 643
Task summary list 643
ISDN PRI2 implementation 643
ISDN Basic Rate Interface implementation 646
Maintenance and diagnostics guidelines 650
Call Trace (LD 80) 650
No correlation between two connections for the same call 651
Feature operation 651

Feature description

The 7 kHz/Videotelephony teleservices feature supports the 7 kHz teleservice, and the Videotelephony teleservice.

The 7 kHz teleservice is an enhanced telephony teleservice offering better voice quality. It is a real-time teleservice in which a voice call uses one circuit-mode 64 kbit/s connection with 7 kHz bandwidth.

The Videotelephony teleservice is a real-time, audiovisual teleservice in which voice and moving pictures are interchanged by means of one or two 64 kbit/s circuit-mode connections.

The 7 kHz/Videotelephony teleservices are supported over EuroISDN PRI2 and Basic Rate Trunk interfaces, and on ETSI Basic Rate Interface sets.

This feature also supports the fall-back capability. Fall-back allows a request for the telephony 7 kHz teleservice or for the videotelephony teleservice, to use the alternate teleservice. In the case of the 7 kHz teleservice, the alternative is the 3.1 kHz teleservice. In the case of the Videotelephony teleservice, the alternative is the 7 kHz teleservice (if supported), or the 3.1 kHz teleservice.

This feature supports the following communications:

- videotelephone terminal to videotelephone terminal
- 7 kHz terminal to 7 kHz terminal
- videotelephone terminal to 7 kHz terminal or 3.1 kHz terminal, if fall-back allowed
- 7 kHz terminal to 3.1 kHz terminal, if fall-back allowed

Originating and terminating terminals can be local or remote, but calls using one of these teleservices with at least one remote terminal must be made over a EuroISDN PRI2 or EuroISDN BRI link.

When a user originates a call requesting a 7 kHz or videotelephony teleservice, the user can choose if fall-back is allowed or not, that is, whether or not the call is to be established with the alternative teleservice if the requested teleservice is not available. Such request can be made either from a local ETSI BRI set supporting the teleservice, or from a remote set whose request is received over a EuroISDN link. The terminating party may accept the call, if the teleservice is supported end to end, or reject the call, if the requested teleservice is not supported.

> ***Note:*** Notice that a videotelephone terminal may not support the telephony 7 kHz teleservice.

7 kHz or videotelephony teleservice request with fall-back not allowed

If fall-back is not allowed, the call may be either established with the requested teleservice, or rejected.

If the call request reaches a non EuroISDN link, or if the requested set is a non-ETSI BRI set, the call is rejected. For analog (500/2500) sets and Meridian proprietary sets, the call is rejected. The call is also rejected for calls over a EuroISDN link and for ETSI BRI sets not configured to support the 7 kHz/Videotelephony teleservices (the 7VOD or 7DTA teleservice EuroISDN for routes, or the VID7 supplementary service for ETSI BRI sets).

7 kHz or videotelephony teleservice request with fall-back allowed

If fall-back is allowed, the call is established with the preferred teleservice or with the alternate teleservice.

If the call request reaches a non EuroISDN link, or if the destination set does not support the requested teleservice, the call is established with the alternate teleservice (3.1 kHz teleservice). The originator is notified that fall-back has occurred.

Establishment of a second connection for videotelephony calls

When a call is established with the videotelephony teleservice, a second connection can be established to provide a better video quality. Only the calling party can initiate a request for a second connection, and this only after the first connection is established.

Operating parameters

This feature is not supported over QSIG, DPNSS1, or MCDN networks. If a EuroISDN call gets routed over a QSIG, DPNSS1, or MCDN link, the call is not established with 7 kHz or videotelephony teleservice. If fall-back is allowed, call is established with the alternate (3.1 kHz) teleservice, or else the call is dropped.

This feature requires that the EuroISDN ETS 300-403 compliance update feature be implemented (IFC = E403 in LD 16).

Feature interactions

Call Forward All Calls

Fall-back may be applied, if Call Forward All Calls has been activated. If fall-back is not allowed, the call is treated as per normal operation.

If fall-back has already occurred, a call request for the alternate (3.1 kHz) teleservice is sent to the forwarded-to set or trunk. If fall-back has not already occurred, the call is treated as per normal operation for the forwarded-to set or trunk.

Call forward Busy

If Call Forward Busy feature has been activated on a busy set, the call is established with the alternate (3.1 kHz) teleservice, if fall-back is allowed. If fall-back is not allowed, the call is rejected.

Call Forward No Answer

When Call Forward No Answer has been activated on a set, the call is treated as per normal for the forwarded-to set or trunk, if fall-back is not allowed.

If fall-back is allowed and has already occurred, a call request for the alternate (3.1 kHz) teleservice is sent to the forwarded-to set or trunk. If fall-back is allowed and has not already occurred, the call is treated as per normal for the forwarded-to set or trunk.

Hunting

If Hunting has been applied to a busy destination, destination set is busy, and if Hunting feature is configured, the call is treated as per normal for the hunted-to set or trunk.

DISA call

For a A DISA call requesting 7 kHz or videotelephony teleservice, fall-back may occur, if allowed, or the else the call is rejected.

ACD DN

For request for 7 kHz or videotelephony teleservice terminating on an ACD DN, fall-back may occur, if allowed, or the else the call is rejected.

Advice On Charge

If a second connection is established for a videotelephony teleservice, the charge information is received separately for the two connections, since there is no way to identify that the two connections relate to the same videotelephony call.

Multiple Appearance Directory Number

An incoming call to a Multiple Appearance DN associated to several sets (non BRI sets) is presented to all sets. For an incoming call to a Multiple Appearance DN requesting the 7 kHz or videotelephony teleservice, fall-back may occurs if allowed, or else the call is rejected.

Network Alternate Route Selection

NARS route selection is done by looking at the Data Selection (DSEL) values of the different routes. An outgoing call requesting the 7 kHz or videotelephony teleservice can only use route defined with 7DTA or 7VOD at DSEL prompt, whether fall-back is allowed or not.

If fall-back is allowed and if no route has been found for the preferred teleservice, then fall-back occurs and a new route selection is started for the alternate teleservice.

If fall-back is allowed and occurs further in the network, a voice call may be established using a route defined for data (DSEL = 7DTA).

Customer Controlled Routing

For a call request for the 7 kHz or videotelephony teleservice terminating on a CCR Control DN (same as an ACD DN), fall-back occurs if allowed, or else the call is rejected.

Symposium Call Center Server

For a call request for the 7 kHz or videotelephony teleservice terminating on a Symposium Call Center Server, fall-back occurs if allowed, or else the call is rejected.

Meridian IVR

For a call request for the 7 kHz or videotelephony teleservice terminating on a Meridian IVR application, fall-back occurs if allowed, or else the call is rejected.

Meridian Link

For a call request for the 7 kHz or videotelephony teleservice terminating on a Meridian link application, fall-back occurs if allowed, or else the call is rejected.

Meridian Mail

For a call request for the 7 kHz or videotelephony teleservice terminating on Meridian Mail, fall-back occurs if allowed, or else the call is rejected.

Feature packaging

The following packages are required for the 7 kHz/Videotelephony teleservices feature:

For ISDN PRI2:

- Integrated Services Digital Network (ISDN) package 145
- 2.0 Mbps Primary Rate Interface (PRI2) package 154
- ISDN Supplementary Features (ISDN_SUPP) package 161
- International Primary Rate Access (IPRA) package 202
- Multi-Purpose Serial Data Link (MSDL) package 222
- EuroISDN (EURO) package 261

For ISDN Basic Rate trunking:

- Integrated Services Digital Network (ISDN) package 145
- ISDN Supplementary Features (ISDN_SUPP) package 161
- International Primary Rate Access (IPRA) package 202
- Basic Rate Interface (BRI) package 216
- Basic Rate Interface Trunking (BRIT) package 233
- EuroISDN (EURO) package 261

For ISDN Basic Rate line application:

- Basic Rate Interface Line (BRIL) package 235

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 17 - Configure D-Channel for the ETS 300 403 interface.

2 LD 16 - Configure the 7 kHz/Videotelephony teleservices for a PRI2 EuroISDN E403 route.

3 LD 14 - Configure the 7 kHz/Videotelephony teleservices PRI2 EuroISDN E403 trunks.

4 LD 16 - Configure the 7 kHz/Videotelephony teleservices for an ISDN BRI EuroISDN E403 route, in the Route Data Block.

5 LD 27 - Configure the ETSI ISDN BRI sets, on the Digital Subscriber Loop (DSL), for voice and data.

6 LD 27 - Configure the Terminal Service Profile (TSP) for voice and data, and the 7 kHz/Videotelephony teleservices on the ETSI ISDN BRI sets.

ISDN PRI2 implementation

LD 17 - Configure D-Channel for the ETS 300 403 interface.

Prompt	Response	Description
REQ:	CHG	Change existing data.
TYPE:	ADAN	Action Device and Number.
- ADAN	CHG DCH xx	Change existing D-channel data.
...		
- IFC	E403	EuroISDN Interface conforming to the ETS 300 403 or ETS 300 102 protocol.
- - CNTY	xxxx	Enter country pertaining to the E403 interface.

LD 16 - Configure the 7 kHz/Videotelephony teleservices for a PRI2 EuroISDN E403 route.

Note: The EuroISDN route using the 7 kHz/Videotelephony teleservices must be configured as using the interface type of ETS 300 403 (IFC = E403), even if the link to the Central Office is still be based on ETS 300 102 implementation.

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	RDB	Route Data Block.
CUST	xx	Customer number, as defined in LD 15. xx = 0-99 for Options 51C-81C xx = 0-31 for Option 11C.
ROUT	0-511 0-127	Route number, for Options 51C-81C. For Option 11C.
TKTP	aaaa	Trunk type.
...		
DTRK	YES	EuroISDN route is digital.
- DGTP		Digital trunk type.
	PRI2	PRI2 = 2.0 Mbps Primary Rate Interface.
- IFC	E403	EuroISDN Interface conforming to the ETS 300 403, or the extended ETS 300 102 version for country-specific interfaces. Refer to the Note above.
- - CNTY		Enter country pertaining to the E403 interface. If either ETSI or NET are entered, the interface is fully compliant with ETS 300 403. The entered value must match the entry in LD 17.
	ETSI NET	ETS 300 403 for the user side. ETS 300 403 for the network side.
		If any of the countries listed on the following page are entered, the interface functions with the extended ETS 300 102 capabilities.

	AUS DEN FIN GER ITA NOR POR SWE EIR DUT SWI BEL ESP UK FRA CIS	Austria. Denmark. Finland. Germany. Italy. Norway. Portugal. Sweden. Ireland. Holland. Switzerland. Belgium. Spain. United Kingdom. France. Commonwealth of Independent States (Russia and the Ukraine).
...		
- DSEL		Data selection.
	7VOD 7DTA	The route supports voice and data calls, and the telephony 7 kHz/Videotelephony teleservices. The route supports data calls, and the telephony 7 kHz/Videotelephony teleservices.
...		

LD 14 - Configure the 7 kHz/Videotelephony teleservices PRI2 EuroISDN E403 trunks.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	aaaa	Trunk type. Must match the trunk type configured in LD 16.
CUST	xx	Customer number, as defined in LD 15. xx = 0-99 for Options 51C-81C xx = 0-31 for Option 11C.

RTMB ...	0-511 1-510 0-127 1-510	Route number and member number, for Options 51C-81C. For Option 11C.

ISDN Basic Rate Interface implementation

LD 16 - Configure the 7 kHz/Videotelephony teleservices for an ISDN BRI EuroISDN E403 route, in the Route Data Block.

Note: The EuroISDN route using the 7 kHz/Videotelephony teleservices must be configured as using the interface type of ETS 300 403 (IFC = E403), even if the link to the Central Office is still be based on ETS 300 102 implementation.

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	RDB	Route Data Block.
CUST	xx	Customer number, as defined in LD 15. xx = 0-99 for Options 51C-81C xx = 0-31 for Option 11C.
ROUT	0-511 0-127	Route number, for Options 51C-81C. For Option 11C.
TKTP	aaaa	Trunk type.
...		
DTRK	YES	EuroISDN route is digital.
- DGTP	BRI	Digital trunk type is Basic Rate Interface.
- IFC	E403	EuroISDN Interface conforming to the ETS 300 403, or the extended ETS 300 102 version for country-specific interfaces. Refer to the Note above.

- - CNTY		Enter country pertaining to the E403 interface. If either ETSI or NET are entered, the interface is fully compliant with ETS 300 403. The entered value must match the entry in LD 17.
	ETSI NET	ETS 300 403 for the user side. ETS 300 403 for the network side. If any of the countries listed on the following page are entered, the interface functions with the extended ETS 300 102 capabilities.
	AUS DEN FIN GER ITA NOR POR SWE EIR DUT SWI BEL ESP UK FRA CIS	Austria. Denmark. Finland. Germany. Italy. Norway. Portugal. Sweden. Ireland. Holland. Switzerland. Belgium. Spain. United Kingdom. France. Commonwealth of Independent States (Russia and the Ukraine).
...		
- DSEL		Data selection.
	7VOD 7DTA	The route supports voice and data calls, and the telephony 7 kHz/Videotelephony teleservices. The route supports data calls, and the telephony 7 kHz/Videotelephony teleservices.
...		

LD 27 - Configure the ETSI ISDN BRI sets, on the Digital Subscriber Loop (DSL), for voice and data.

Prompt	Response	Comment
REQ	NEW CHG	Add new data Change existing data.
TYPE	DSL	Digital Subscriber Loop data block.
DSL	l s c dsl#	DSL Terminal Number location lll (superloop) = 0-156 (must be zero or a number divisible by 4) s (shelf) = 0-1 cc (card) = 0-15 dsl# (DSL location) = 0-7
		DSL Terminal Number location, Option 11C.
	cc dsl	cc (card) = 1-20 dsl# (DSL number) = 0-7
CUST	xx	Customer number, as defined in LD 15. xx = 0-99 for Options 51C-81C xx = 0-31 for Option 11C.
CTYP	SILC UILC	Interface card type is SILC or UILC.
APPL	BRIL	Basic Rate Interface.
MISP	0-158 0-9	MISP loop number for Options 51C-81C MISP loop number for Option 11C.
MODE	(TE) NT	Mode, user side (TE) or network side (NT).
B1CT	VCE DTA	B-Channel 1 call type is voice and data. ***Note***: At least one of the B-Channels must be configured for voice and data.
B2CT	VCE DTA	B-Channel 2 call type is voice and data. ***Note***: At least one of the B-Channels must be configured for voice and data.
...		

LD 27 - Configure the Terminal Service Profile (TSP) for voice and data, and the 7 kHz/Videotelephony teleservices on the ETSI ISDN BRI sets.

Prompt	Response	Comment
REQ	NEW CHG	Add new data Change existing data.
TYPE	TSP	Terminal Service Profile data block.
DSL	 lll s cc dsl# cc dsl	DSL Terminal Number location lll (superloop) = 0-156 (must be zero or a number divisible by 4) s (shelf) = 0-1 cc (card) = 0-15 dsl# (DSL location) = 0-7 DSL Terminal Number location, Option 11C. cc (card) = 1-20 dsl# (DSL number) = 0-7
...		
BCH	1 2	B-Channel (either 1 or 2) to which the TSP is associated.
...		
- CT	VCE DTA	The call type that the TSP supports is voice and data.
...		
SSRV_ETSI	VID7 XVID7	The ETSI ISDN BRI set supports the 7kHz/Videotelephony teleservices. Precede with an X to remove the configured 7kHz/Videotelephony teleservices.
...		

Maintenance and diagnostics guidelines

Call Trace (LD 80)

LD 80 is used to gather information pertaining to a call. If the call originated or terminated over a ISDN trunk, the following information is printed, in addition to the basic call information:

- call reference number
- bearer capability
- call state
- calling number
- called number
- Virtual Network Services Directory Number, if applicable

New bearer capability print information

The new printed bearer capability information which is printed for the 7kHz/Videotelephony teleservices feature is ‘UDI-TA’, which pertains to the ‘Unrestricted Digital Information with Tones/Announcement’ Information Transfer Capability Information Element (IE).

Bearer capability print format when fall-back is not allowed

If fall-back is not allowed, there is only one bearer capability Information Element in the received SETUP message. The print format is not changed. The format is ‘BEARER CAP = aaaaaa’, where ‘aaaaaa’ = one of ‘VOICE, 64KCLR, 64KRES, 56KRES, 3.1KHZ, DATAUN, UDI-TA, or DATARS’.

Bearer capability print format when fall-back is allowed

If fall-back is allowed, there are two bearer capability IE contained in the received SETUP message. There are two print formats for the bearer capability.

When the used teleservice has not yet been selected, both values are printed in the order that they are received. When the used teleservice has been selected (and whether fall-back occurs or not), only the selected value is printed.

Examples follow:

BEARER CAP = VOICE UDI-TA (if a bearer capability has yet to be selected)

BEARER CAP = UDI-TA (if fall-back has not occurred)

BEARER CAP = VOICE (if fall-back has occurred)

High Layer Compatibility print information

If a bearer capability 'UDI-TA' IE is received, then the High Layer Compatibility (HLC) information is printed on the line below the bearer capability information, whatever the value of the bearer capability.

The HLC print format is 'HLC = aaaaa', where aaaaa = VIDEO or TELE.

For other values, nothing is printed, since these values do not define a teleservice when the bearer capability receives a UDI-TA IE. If two HLC IEs are received, in the case of fall-back, the print format is the same as for the bearer capability print format.

No correlation between two connections for the same call

There is no messaging information within a EuroISDN network to correlate two connections established for the same call. The only way to gather information pertaining to two connections for the same call, is to analyze the calling and called number information associated with each connection.

Feature operation

No specific operating procedures are required to use this feature.

EuroISDN Continuation

Contents

The following are the topics in this section:

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Feature description 653
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Feature interactions 656
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Task summary list 661
Feature operation 667

Regional material statement

ISDN BRI trunking is not available in North America. Contact your system supplier or your Nortel Networks representative to verify support of this product in your area.

Feature description

EuroISDN provides Primary and Basic Rate Interfaces to Central Offices/Public Exchanges that comply with the specifications for Layer 3, as described in ETS 300-102. The EuroISDN Continuation feature expands the scope of the original EuroISDN feature to include application support for Switzerland, Spain, Belgium and the United Kingdom.

In addition, the following functionalities are provided by the EuroISDN Continuation feature:

- Intercept treatment upon reception of an invalid or incomplete called party number;
- Interception to an attendant for EuroISDN voice calls terminating on a data device;
- The capability to listen to tones and announcements provided by the Central Office on call clearing (T306 supported);
- The capability of transferring outgoing EuroISDN calls after completion of dialing (only for Italy);
- Calling Line Identification and Connected Line Identification transparency to or from EuroISDN to or from a Basic Rate Interface (BRI) set;
- The configuration of Connected Line Presentation (COLP) on a per D-channel basis (remote capability);
- 3.1 KHz audio bearer capability for outgoing fax calls, based on a Class of Service assigned to the Analog (500/2500 type) telephone;
- The capability of defining the bearer as “Voice” or “3.1 KHz” on a system basis;
- The addition and display of national or international prefix in front of the received Calling/Connected Line Identification on incoming/outgoing EuroISDN calls;
- Flexible national and local prefixes in addition to the Calling/Connected Line Identification on incoming/outgoing calls based on the route configuration;
- User-to-User information transparency in call control messages;
- Capability of mapping a PROGRESS message or Progress Indicator in a CALL PROCEEDING message into an ALERT or a CONNECT message on a per configuration basis;
- Capability of using different options to build the Calling Line Identification (CLID); and
- Called party number size increase to 31 octets.

This development also provides a subset of the ETSI Generic functional protocol for the support of supplementary services. Implementation relies on the Generic Functional (GF) Transport platform in the ISDN QSIG GF Transport feature. The ETSI GF subset provides two types of supplementary service control entities as follows:

- **Bearer-related transport with a point-to-point transport mechanism**
  This service is used to transport supplementary service protocol information in association with a basic call.
- **Bearer-independent transport with a point-to-point (connection-oriented) mechanism**
  This service is used to transport supplementary service protocol information, which is entirely independent of any existing basic call.

The ETSI GF provides a generic transport platform that supports ETSI-compliant supplementary services. The ETSI GF protocol is implemented on the ETSI, Swiss, German and Danish EuroISDN interfaces.

Operating parameters

Layer 1 and Layer 2 compliance with ETSI requirements are also supported.

If more than one Channel Identification Information Element (IE) is received in a SETUP message, only the first one is used by the Meridian 1. If the Information Element is not available, the call is processed as per channel negotiation configuration. If no negotiation is allowed, the call is released.

The transfer of an unanswered EuroISDN call to a remote ringing set requires disconnect supervision from a TIE trunk. If disconnect supervision is not available when an external user goes on-hook, the trunk could be locked out. Therefore, it is important to ensure that trunks used for a EuroISDN call have disconnect supervision.

With ETSI GF, DN address translation requires association with a customer number. In an ETSI basic call establishment, the customer number association is located through the B-channel, identified in the channel identification IE. If the DN address is not associated with a basic call, the customer number is determined through other means.

For Connected Line Identification Presentation (COLP) supplementary service, sending or restricting connected line identification is not supported on ISDN BRI sets on a per call basis.

Feature interactions

Auto terminate Call

This feature is not supported.

Call Back Queuing and Off-hook Queuing

This feature is not supported with Overlap Signaling.

Call Completion Supplementary Service

Call Completion interacts with Call Transfer Over EuroISDN SN3. Call Completion Free Notification can only be presented to the Call Completion originating station and cannot be transferred to any other station. However, once the Call Completion call is established, it behaves as a normal call with respect to Call Transfer.

End-to-End Signaling

End-to-End Signaling is supported on all outgoing EuroISDN routes as soon as the CALL PROCEEDING message with a Progress Indicator is received.

Flexible Hotline

This feature is not supported with Overlap Signaling.

Incoming Digit Conversion Enhancement

The Incoming Digit Conversion Enhancement (IDC) feature converts incoming digits from a DID route. This feature is supported on the incoming EuroISDN DID routes. Digits received as a called party number are converted if the IDC feature is activated on the route. Digit analysis is then performed on the converted digits by the Meridian 1.

ISDN Basic Rate Interface Connected Line Presentation/Restriction

The EuroISDN Continuation capability adds National and Local prefixes to the connected number being sent. This is programmed on a route basis and is applicable to connected numbers received from a ISDN BRI terminal and sent over a ISDN trunk.

ISDN Calling Line Identification Enhancements

The EuroISDN Continuation feature allows Home National Numbers and Home Local Numbers to be configured on a route. When an ISDN call is made from a set to a EuroISDN interface, the Calling Line Identification (CLID) constructed by EuroISDN, based on the outgoing route, takes precedence over the CLID constructed for the calling station set.

KD3 Signaling

Interworking with KD3 signaling is not supported.

Integrated Service Access (ISA)

Integrated Service Access is not supported.

Interworking Notification

Direct Interworking

When “direct interworking” occurs, the EuroISDN trunk terminates directly on the analog trunk. As a result, the CALL PROCEEDING message is sent to indicate that no further called party information is required. No further call control message is initiated by the analog trunk until answer supervision is provided. If the trunk is a supervised trunk, the resulting CONNECT message will permit the Public Switched Telephone Network (PSTN) to start charging the caller. However, an unsupervised trunk may also be called. In this case, the CONNECT message is sent upon the expiry of the pseudo answer supervision timer.

The destination non-ISDN trunk may be busy instead of ringing; therefore, it is not effective to provide an ALERTING message, since the PSTN provides the caller with ringback. However, the PSTN will be running a T310 timer. Expiry of this timer causes call clearing, and a message must be provided.

The following three alternatives can be configured in LD 16 by responding to the PROG prompt to stop the network T310 timer:

1 A PROGRESS message is sent to the network after the CALL PROCEEDING message.

2 An ALERT message is sent to the network after the CALL PROCEEDING message.

3 A CONNECT message is sent to the network after the CALL PROCEEDING message.

Tandem Interworking

When tandem interworking occurs, the EuroISDN trunk terminates on an ISDN link terminating on an analog trunk. When the tandem SETUP message is sent, the CALL PROCEEDING message is sent to the PSTN to indicate that no further called party information is required. The tandem ISDN link returns a PROGRESS message, indicating interworking with a non-ISDN trunk.

Since the PSTN does not implement Annex N, proposed by ETSI, it runs a T310 timer. A message must be provided to stop the T310 timer.

The following three alternatives can be configured in PROG prompt LD 16 to stop the network T310 timer:

1 A PROGRESS message is sent to the network after the CALL PROCEEDING message.

2 An ALERT message is sent to the network after the CALL PROCEEDING message.

3 A CONNECT message is sent to the network after the CALL PROCEEDING message.

When interworking with an analog trunk without answer supervised signaling, the Meridian 1 should be configured to send a CONNECT message rather than an ALERT message. An ALERT or CONNECT message stops the receipt of digits, which implies that all digits have been received.

Networking Features

Some networking features currently exist on more than one ISDN interface implemented on the Meridian 1. These features are listed inTable 52. Any networking feature that does not appear in the table is only supported on one ISDN interface and is rejected by the gateway when the service is requested. That is the case for all Meridian Customer Defined Network (MCDN) features that are not supported over the EuroISDN or QSIG interface.

Table 52
Networking features supported by more than one ISDN interface

	Euro-ISDN	MCDN	QSIG	BRI sets	DPNSS	MFC	DTI2	Analog
Calling Line ID	Yes	Yes	Yes	Yes	Yes	No	No	No
Connected Number	Yes	Yes	Yes	No	Yes	No	No	No
Transit Counter	No	Yes	Yes	No	Yes	No	No	No

Special Dial Tone after Dialed Numbers

Special dial tones after dialed numbers are not supported for incoming calls.

Transfer of Unanswered Call

The EuroISDN Continuation feature supports the transfer of a call from a set dialing an external number, before the external set answers, to both local and remote sets upon ringing.

Virtual Network Services

A EuroISDN link can be used as a B-Channel for the Virtual Network Services feature.

R2MFC Calling Number Identification/Call Detail Recording Enhancements

The outgoing Calling Line Identification (CLID) element of the EuroISDN Continuation feature is mutually exclusive with the R2MFC CNI/CDR Enhancements feature. If the CLID is to be composed from the EuroISDN Continuation feature, it will not contain the Calling Number Identification (CNI). If the CLID is to be composed from the CNI, no prefixes will be added to the number.

Feature packaging

EuroISDN Continuation is included in EuroISDN (EURO) package 261.

For Primary Rate Interface (PRI), the following software packages are required:

- Digit Display (DDSP) package 19;
- Integrated Services Digital Network (ISDN) package 145;
- 2.0 Mbit Primary Rate Interface (PRI2) package 154;
- Integrated Services Digital Network Supplementary Features (ISDN INTL SUP) package 161;
- International ISDN PRI (IPRA) package 202; and
- Multi-purpose Serial Data Link (MSDL) package 222.

For Basic Rate Interface (BRI), the following software packages are required:

- Digit Display (DDSP) package 19;
- Integrated Services Digital Network (ISDN) package 145;
- Integrated Services Digital Network Supplementary Features (ISDN INTL SUP) package 161;
- International ISDN PRI (IPRA) package 202;
- Meridian 1 Extended Peripheral Equipment (XPE) package 203;
- Basic Rate Interface (BRI) package 216; and
- Integrated Services Digital Network Basic Rate Interface Trunk Access (BRIT) package 233.

Overlap Signaling is included in (OVLP) package 184. For the Uniform Dialing Plan (UDP), the following packages are also required:

- Basic Routing (BRTE) package 14;
- Digit Display (DDSP) package 19;
- Network Call of Service (NCOS) package 32;
- Basic Alternate Route Selection (BARS) package 57; and
- Network Alternate Route Selection (NARS) package 58.

For the Coordinated Dialing Plan (CDP), package 59 and the following packages are required:

- Integrated Services Digital Network (ISDN) package 145;
- 2.0 Mbit Primary Rate Interface (PRI2) package 154;
- Flexible Numbering Plan (FNP) package 160;
- Integrated Services Digital Network Supplementary Features (ISDN INTL SUP) package 161; and
- International Primary Rate Access (IPRA) package 202.

The following packages are required for EuroISDN to interact with Multifrequency Compelled Signaling (MFC), Multifrequency Compelled Signaling for Socotel (MFE), Direct Inward Dialing (DID), Digital Access Signaling System #2 (DASS2), and Digital Private Network Signaling System #1 (DPNSS1):

- Universal ISDN Gateway (UIGW) package 283; and
- Enhanced DPNSS1 Gateway (DPNSS189I) package 284.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 10 – Configure Fax Allowed Class of Service for Analog (500 type) set.

2 LD 17 – Create a new D-channel.

3 LD 16 – Configure new DID routes (the same responses to the IFC and CNTY prompts, as were used in LD 17, must be entered.)

4 LD 14 – Configure new DID trunks.

LD 10 – Configure Fax Allowed Class of Service for Analog (500 type) set.

Prompt	Response	Description
REQ:	NEW	Add.

TYPE:	500	Telephone type.
...		
CLS	FAXA	Fax Class of Service allowed for set or modem. ISDN call is generated with 3.1 KHz bearer capability. FAXD = Fax Class of Service denied.

LD 17 – Create a new D-channel.

Prompt	Response	Description
REQ	NEW	Add.
TYPE	ADAN	Action Device and Number.
- ADAN	NEW DCH x	New D-channel at port number x.
- CTYP	MSDL	Card type, where: MSDL = Multipurpose Serial Data Link.
- GRP	0-4	Network Group Number.
- DNUM	0-15	Device number for I/O ports.
- PORT	0-3	Port number on MSDL card.
- USR	PRI	D-channel for ISDN PRI only. Precede with X to remove.
IFC	EURO	Interface type for D-channel, where: EURO = EuroISDN.
	SWIS	IFC SWIS is for PRI2 (SN2).

- - CNTY	AUS DEN (ETSI) FIN GER ITA NOR POR SWE EIR DUT SWI BEL ESP UK	Austria. Denmark. ETS 300-102 basic protocol. Finland. Germany. Italy. Norway. Portugal. Sweden. Ireland. Holland. Switzerland. Belgium. Spain. United Kingdom.
...		
- - DCHL	0-159	PRI loop number.
- RCAP	COLP	Enter COLP to support Connected Line Identification Presentation as a remote capability. Enter XCOL to remove Connect Line Identification Presentation.
PINX_CUST	0-99	This customer number will be used for DN address translation, associated with bearer independent connection messages received on this D-channel.
...		
PARM	CHG	Change system parameters.
BCAP	(SPEE) 31KH	Speech (the default). 3.1 Khz bearer capability setting for outgoing voice calls.

LD 16 – Configure new DID routes (the same responses to the IFC and CNTY prompts, as were used in LD 17, must be entered.)

Prompt	**Response**	**Description**
REQ	NEW	Add.
TYPE	RDB	Route Data Block.

CUST	xx	Customer number.
ROUT	xx	Route number.
TKTP	DID	Trunk type, where: DID = Direct Inward Dialing.
...		
DTRK	YES	Digital trunk route.
- DGTP		Digital trunk type for route.
	PRI2	2.0 Mb Primary Rate Access.
	BRI	ISDN Basic Rate Access.
- IFC	EURO	Interface type for route, where: EURO = EuroISDN.
	SWIS	IFC SWIS is for PRI2 (SN2).
- - CNTY	AUS	Austria.
	DEN	Denmark.
	(ETSI)	ETS 300-102 basic protocol.
	FIN	Finland.
	GER	Germany.
	ITA	Italy.
	NOR	Norway.
	POR	Portugal.
	SWE	Sweden.
	EIR	Ireland.
	DUT	Holland.
	SWI	Switzerland.
	BEL	Belgium.
	SPA	Spain.
	UK	United Kingdom.

CLID	OPT0	Prefix = 0, for North American dialing plan. This is the default value for ESIG and ISIG interfaces.
	OPT1	Prefix = 1, for international PFXs in CLID, any numbering type supported. This is the default value for all EuroISDN interfaces.
	OPT2	Prefix = 2, for international PFXs in CLID, CCITT numbering type supported: UKWN, INTL, NPA, and NXX. Default value for CO/DID routes for the Telecom New Zealand interface.
	OPT3	Prefix = 3, for international PFXs in CLID, only NXX number type supported. Default value for TIE routes for the Telecom New Zealand interface.
	OPT4	For international COs, if the call originates from a CO trunk type, add nothing. Otherwise, add PFX1 and PFX2. This is the default value for the Hong Kong, Singapore, and Thailand interfaces.
	OPT5	This is the same as OPT4, except it supports a maximum of 10 digits in the CLID. This is the default value for the Austrian interface.
PROG	NCHG	Send PROGRESS (default value for all interfaces, except Austria).
	MALE	Send ALERT after CALL PROCEEDING.
	MCON	Send CONNECT after CALL PROCEEDING (this is the default value for the Austrian interface).
...		
RCAP	COLP	Connected Number IE Presentation is supported on the far end (enter XCOLP to remove COLP).
- CPFXS	(YES) NO	Customer-defined Prefixes option. This prompt is added as one of the sub-prompts of ISDN = YES. It is added at the end of the ISDN sub-prompts. If CPFXS = YES, when constructing the Calling or Connected Line Identification, the prefixes are retrieved from the Customer Data Block via the PFX1 and PFX2 prompts in LD 15, as is currently done. This is the default response. If CPFXS = NO, when constructing the Calling or Connected Line Identification, the prefixes are retrieved from the Route Data Block via the HNTN and HLCL prompts in LD 16.

- - HNTN	0-9999	Home National Number. This number is similar to the PFX1 number prompted in LD 15. It is added to this overlay so that this prefix can be configured on a route basis as required in some countries (e.g., Italy). As is the case with PFX1, the HNTN prefix can be from one-to-four digits long. This prompt is displayed only if CPFXS = NO. If only a <CR> is entered, this prompt keeps its previous configuration. If no value was configured previously, no value will be configured. Enter X to delete the digits.
HLCL	0-9999	Home Location Number. This number is similar to PFX2 number prompted in LD 15. It is added to this overlay so that this prefix can be configured on a route basis as required in some countries (e.g., Italy). As is the case with PFX2, the HLCL prefix can be from one-to-four digits long. This prompt is displayed only if CPFXS = NO. If only a <CR> is entered, this prompt keeps its previous configuration. If no value was configured previously, no value will be configured. Enter X to delete the digits.
ADDP	(NO), YES	If ADDP = YES, the prefixes 0 (national) or 00 (international) are added to the Calling Party Number if the Type of Number (TON) is public. If ADDP = NO, the Calling or Connected Party Number displayed is not modified.

LD 14 – Configure new DID trunks.

Prompt	Response	Description
REQ	NEW xx	Add a new data block to the system. Follow NEW with a value of 1-255 to create that number of consecutive trunks.
TYPE	DID	Direct Inward Dialing data block.
TN	l s c u	Terminal number.
	c u	For Option 11C.
...		
RTMB	0-511 1-510 0-127 1-510	Route number and member number, for Options 51C-81C. Route number and member number, for Option 11C.

Feature operation

No specific operating procedures are required to use this feature.

EuroISDN Continuation Phase III

Contents

The following are the topics in this section:

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Regional material statement

ISDN BRI trunking is not available in North America. Contact your system supplier or your Nortel Networks representative to verify support of this product in your area.

Feature description

The EuroISDN feature provides ISDN PRI and ISDN BRI connectivity between the Meridian 1 and Public Exchanges that comply with the European Telecom Standards Institute (ETSI) specification ETS 300 102 for the Layer 3. The interfaces provided by this feature also comply with the country-specific Application Documents for Austria, Denmark, Finland, Germany, Holland, Ireland, Italy, Norway, Portugal, Sweden, and Switzerland (only ISDN BRI connectivity).

The EuroISDN Continuation feature expanded the scope of the original EuroISDN feature to provide application support for Belgium, Spain, Switzerland (ISDN PRI connectivity added to the ISDN BRI connectivity), and the United Kingdom.

EuroISDN Continuation Phase III adds France, Russia and the Ukraine to the list of countries having country-specific Application Documents compliance for EuroISDN.

In addition to providing all of the functionalities provided by the original introduction of EuroISDN and the EuroISDN Continuation, EuroISDN Continuation Phase III introduces the following new functionalities for all EuroISDN interfaces:

- optional sending of last forwarding DN as CLID
- Trunk Route Optimization - before Answer applied to incoming EuroISDN trunks
- Numbering Plan Identification (NPI) and Type of Number (TON) included in CDR tickets for EuroISDN calls

These new functionalities are described in the sections that follow.

Optional sending of last forwarding DN as CLID

In a call redirection scenario (Call Forward All Calls, Call Forward No Answer, Hunt, and the ACD redirections, Night Call Forward and Interflow) occurring at a gateway node, the (optional) capability, on a per system basis, of sending the last forwarding DN as Calling Line Identification (CLID) information. This functionality is controlled by a new prompt, the OCLI (Outgoing CLID) prompt, that has been introduced in Overlay 15 and which has three possible responses (NO, EXT, or ALL).

This new functionality applies to the following types of calls being redirected at a gateway node, as described in the pages that follow.

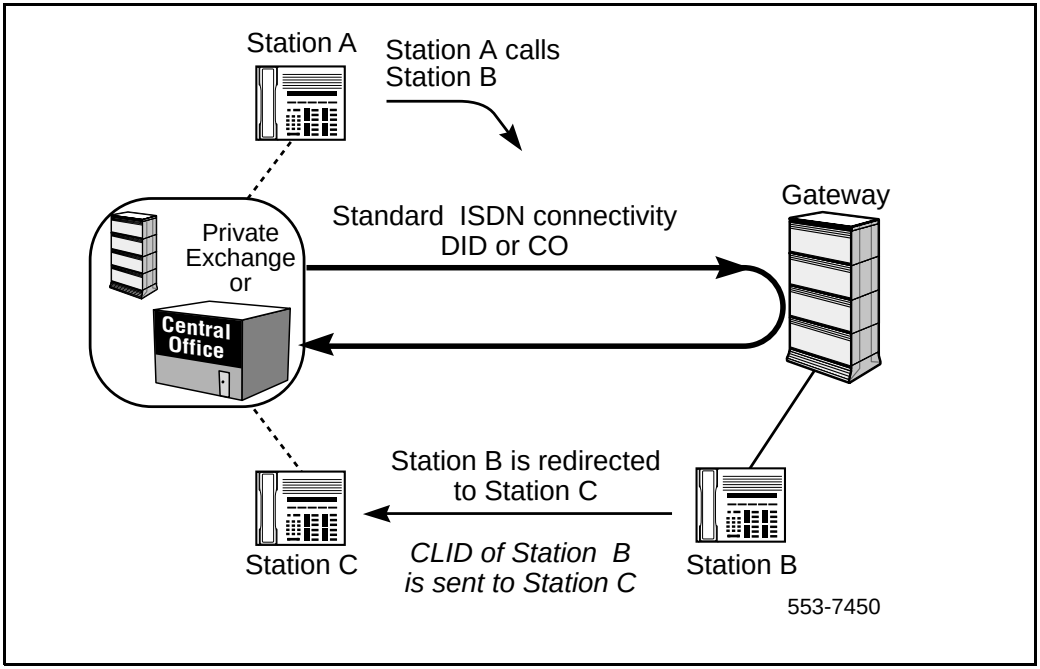
Note: There is a limitation on the functionary if the last redirection is due to ACD NCFW or Interflow, and if the redirection is preceded by one or more redirections on the same node. In such a case, the called number on the node is sent as CLID rather than the ACD DN.

- Incoming EuroISDN DID or Central Office calls coming from a Public Network Central Office or a Private Exchange over a standard ISDN connectivity**,** are forwarded back to the Public Network.

  Note: Standard ISDN connectivity means all supported ISDN connectivities including, EuroISDN, Asia Pacific, and NI-2.

  — Station A, located at a Public Network Central Office or a Private Exchange, calls Station B at a Gateway node. Station B is redirected to Station C, located at the same or another Public Network Central Office or Private Exchange as Station A. If OCLI = EXT or ALL, the CLID of Station B is sent to Station C. Refer to Figure 63.

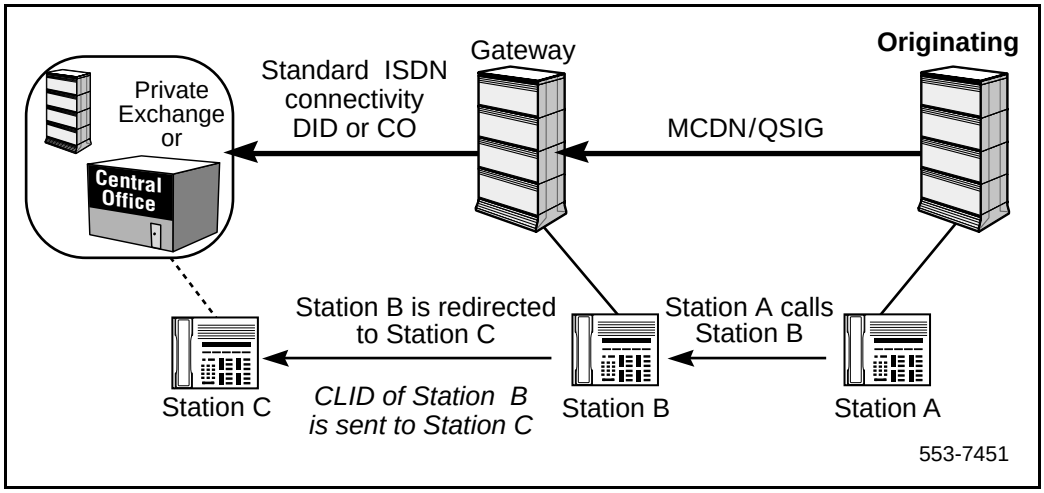
Figure 63
Incoming EuroISDN call redirected back to the Public Network/PBX



- MCDN/QSIG calls from an originating node, are being redirected to a Public Network Central Office or a Private Exchange over a standard ISDN connectivity.

  — Station A, located at an originating node, calls Station B located at a gateway node. Station B is redirected to Station C, located at a Public Network Central Office or a Private Exchange. If OCLI = ALL, the CLID of Station B is sent to Station C. Refer to Figure 64.

Figure 64
MCDN/QSIG call redirected to the Public Network/PBX

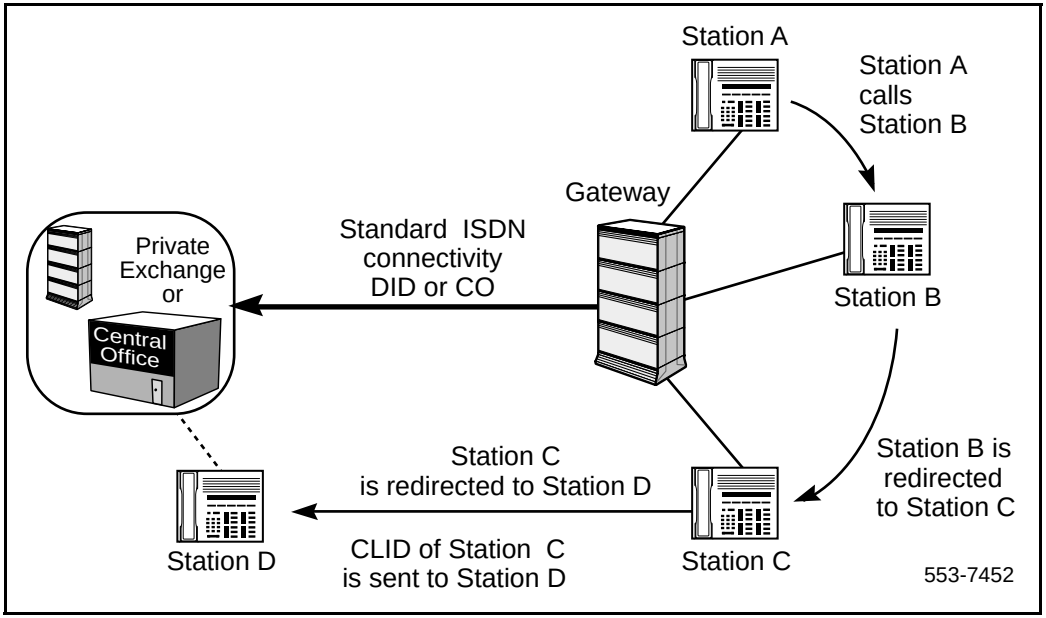


- Internal calls (in a stand-alone scenario) are being redirected to a Public Network Central Office or a Private Exchange over a standard ISDN connectivity.

  — Station A, Station B, and Station C are all located on the same gateway node. Station A calls Station B, which is redirected to Station C. Station C is redirected to Station D located at a Public Network Central Office or a Private Exchange. If OCLI = ALL, the CLID of Station C is sent to Station D. Refer to Figure 65.

  Note: If Station B is redirected to an ACD queue in via ACD NCFW or Interflow across a Standard ISDN connectivity, then the CLID sent to Station C will be that of the number called by Station A rather than that of the ACD DN. This is due to the limitation on ACD redirection described in the Note on page 671.

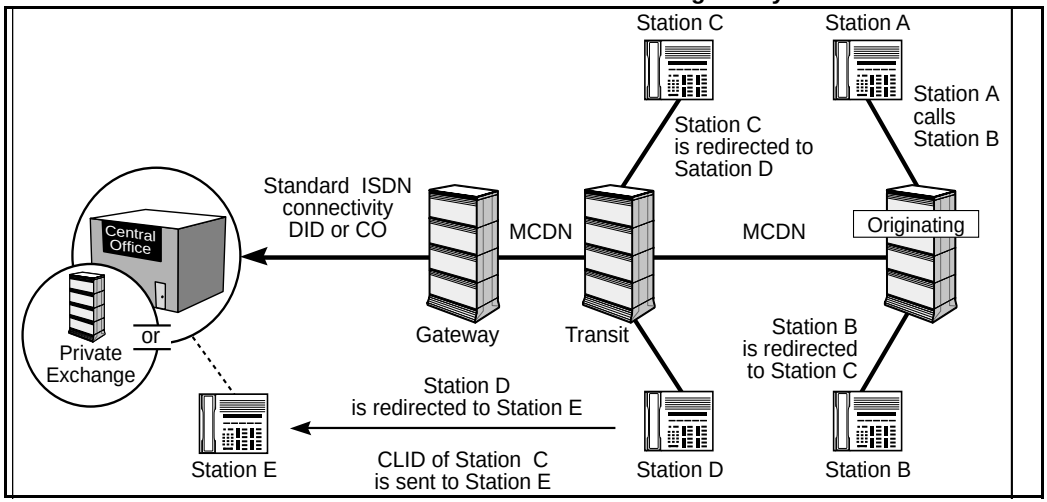
Figure 65
Internal call (stand-alone case) redirected to the Public Network/PBX



When the redirection does not occur at the gateway node for calls redirected to a Public Network Central Office or a Private Exchange over a standard ISDN connectivity, the outgoing CLID is that of the redirecting number information included in the SETUP message and received at the gateway node. The redirecting number information is the first redirecting DN on the last redirecting node.

- Station A and Station B are located at the same originating node. Station A calls Station B, which is redirected to Station C located at a transit node. Station C is redirected to Station D on the same transit node. Station D is redirected through a gateway node, to Station E located at a Public Network Central Office or a Private Exchange. If OCLI = ALL, the CLID of Station C is sent to Station E, since the redirecting number information is the first redirecting DN (that of Station C) on the last redirecting node (at the transit node). Refer to Figure 66.

Figure 66
MCDN call redirected to the Public Network/PBX from a non-gateway node

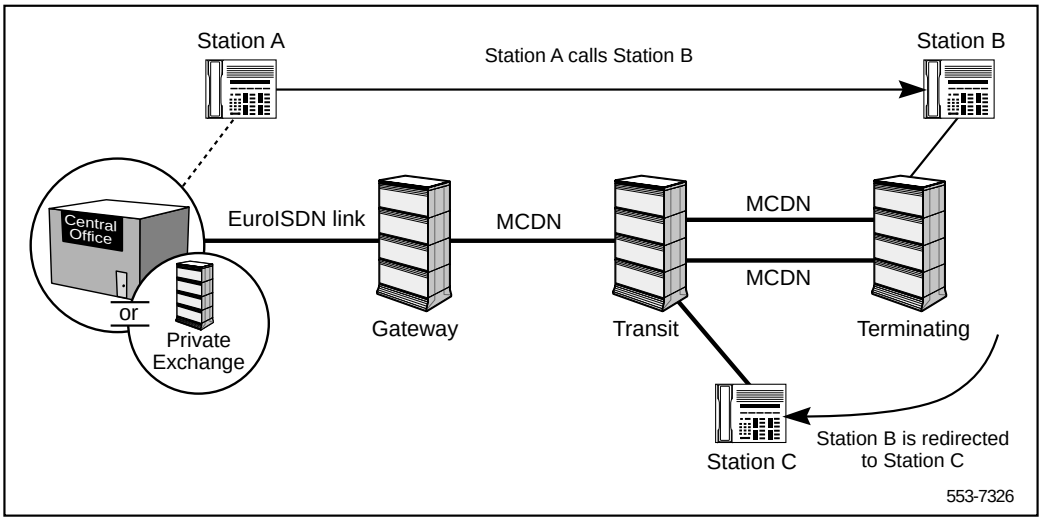


Trunk Route Optimization - before Answer on EuroISDN trunks

Trunk Route Optimization before Answer (TRO-BA) is enhanced to allow TRO-BA to be applied to EuroISDN trunks. The trunk optimization occurs within an MCDN network to eliminate redundant trunks due to a call redirection scenario (Call Forward All Calls, Call Forward No Answer, Call Forward Busy, and Hunt).

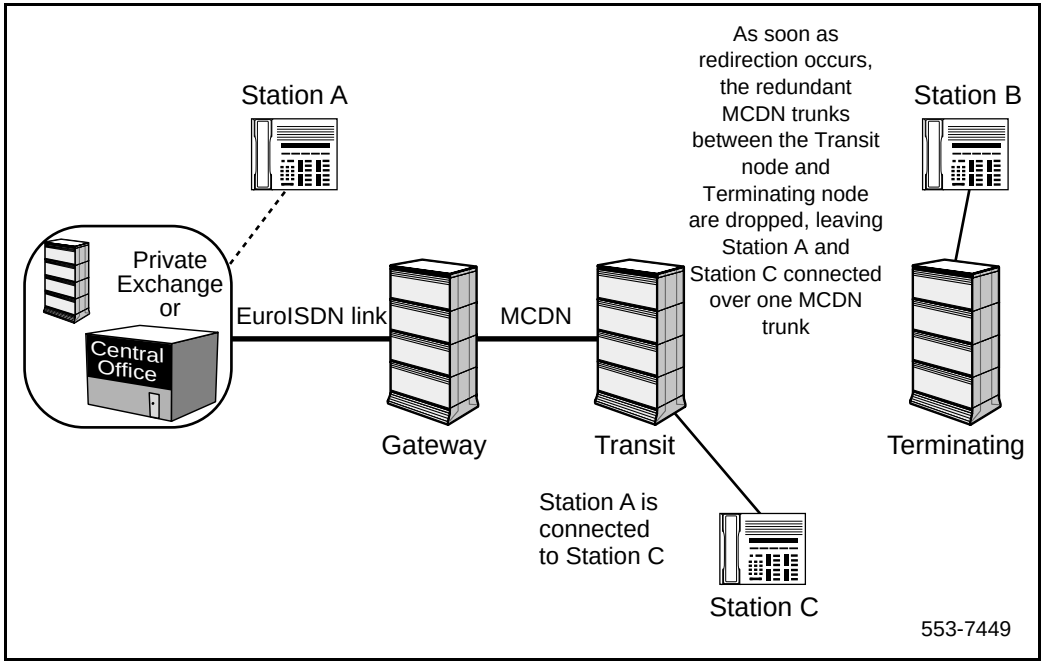
- Station A, located at a Public Network Central Office or a Private Exchange, calls Station B at a terminating node over an MCDN trunk. Station B is redirected to Station C, located at a transit node, over another (redundant) MCDN trunk (refer to Figure 67).

Figure 67
EuroISDN calling scenario before Trunk Optimization is applied



- As soon as the redirection occurs at the redirecting node (the terminating node), trunk optimization is invoked, the redundant trunks between the terminating node and the transit node are dropped, and Station C and Station A connected over one MCDN trunk. Refer to Figure 68.

Figure 68
EuroISDN calling scenario after Trunk Optimization has been applied


As soon as redirection occurs, the redundant MCDN trunks between the Transit node and Terminating node are dropped, leaving Station A and Station C connected over one MCDN trunk
Station A
Station B
Private Exchange or
Central Office
EuroISDN link
MCDN
Gateway
Transit
Terminating
Station A is connected to Station C
Station C
553-7449

Numbering Plan Identification and Type of Number in CDR tickets for EuroISDN calls

The Numbering Plan Identification (NPI) and Type of Number (TON) fields may be optionally included in the CDR tickets, for EuroISDN calls. The purpose is to allow billing the charge of a EuroISDN call to the call originator. By entering NEW against the FCDR (Format for Call Detail Recording) prompt, and YES against the CLID prompt in Overlay 17, the Numbering Plan Identification (NPI) and Type of Number (TON) fields are printed as part of the CDR ticket in addition to the CLID field. This functionality applies only for incoming calls over ISDN trunks, since the NPI and TON are derived from the incoming trunk.

The NPI and TON fields are left blank if the calls are internal, are over outgoing ISDN trunks, are over incoming non-ISDN trunks, or if the FCDR prompt is set to OLD or the CLID prompt is set to NO (note that the FCDR prompt takes precedence over the CLID prompt, that is, if FCDR is set to OLD and the CLID prompt is set to YES, the fields are left blank.)

The NPI and TON are both printed on the third line of the CDR ticket, at characters 44-45 and 47, respectively.

Operating parameters

EuroISDN is not supported on non-downloadable D-channel cards.

Interworking with KD3 signaling is not supported.

Integrated Service Access (ISA) is not supported.

Advice of Charge for EuroISDN calls is supported with the Advice of Charge for EuroISDN feature.

The EuroISDN to CIS MF Shuttle gateway is supported, as provided by the CIS MF Shuttle feature.

The Auto Terminate Call feature is not supported.

The Call Back Queuing and Off-hook Queuing feature and the Flexible Hotline feature are not supported with Overlap Signaling.

End-to-End Signaling is supported on all outgoing EuroISDN routes as soon as the CALL PROCEEDING message with a Progress Indicator is received.

Special dial tones after dialed numbers are not supported for incoming calls.

For Connected Line Identification Presentation (COLP) supplementary service, sending or restricting connected line identification is not supported on a per call basis on non-ISDN BRI sets.

For the Optional Sending of Last Forwarding DN as CLID functionality, if more than one ACD redirection takes place when an ACD set is involved, the DN of the called set is sent as the CLID rather than the DN of the last forwarding set. Refer to page 673 for an example.

Feature interactions

Call Completion Supplementary Service

Call Completion interacts with Call Transfer Over EuroISDN SN3. Call Completion Free Notification can only be presented to the Call Completion originating station and cannot be transferred to any other station. However, once the Call Completion call is established, it behaves as a normal call with respect to Call Transfer.

Call Detail Recording

The Optional Sending of Last Forwarding DN as CLID functionality interacts with the CDR feature. The CLID field in the CDR ticket for the redirected outgoing EuroISDN call is modified according to the CLID information in the SETUP message, for the various scenarios described in the section “Optional sending of last forwarding DN as CLID” on page 671.

CLID Enhancements

The Optional Sending of Last Forwarding DN as CLID functionality interacts with the ISDN CLID Enhancements feature, in that the CLID entry programmed against the prime DN of the forwarding set at a gateway node is used to build the outgoing CLID.

Incoming Digit Conversion Enhancement

The Incoming Digit Conversion Enhancement (IDC) feature converts incoming digits from a DID route. This feature is supported on the incoming EuroISDN DID routes. Digits received as a called party number are converted if the IDC feature is activated on the route. Digit analysis is then performed on the converted digits by the Meridian 1.

Incoming Trunk Programmable CLID

The Optional Sending of Last Forwarding DN as CLID functionality interacts with the Incoming Trunk Programmable CLID feature. This feature provides the capability of assigning a billing number to incoming trunks.

In the scenario described on page 675, whereby the redirection does not occur at the gateway node, the incoming redirecting number information is used as the outgoing CLID on the standard ISDN connectivity DID or CO trunk, even though the Incoming Trunk Programmable CLID feature is configured to send a billing number as CLID information.

Intercept Treatment on Invalid or Partial Dialing

The Partial Dial Timing (PRDL), Vacant Number Routing (VNR), and Intercept features handle dialing irregularities on the Meridian 1.

The Intercept feature allows calls with dialing irregularities to be routed to an attendant or to a Recorded Announcement, or to receive overflow or busy tone. The VNR feature allows calls to a vacant number to be routed to another node, where the call is treated as a vacant number, given intercept treatment, or terminated. The PRDL feature allows incoming non ISDN DID calls to be routed to an attendant after a configured amount of time.

With respect to EuroISDN calls with dialing irregularities, the PRDL feature has been enhanced so that when the End of Dial (EOD) timer for PRDL has expired, the calls, instead of being automatically routed to an attendant, now receive the intercept treatment provided by the VNR and Intercept features. A proviso is that the EOD timer used as the PRDL timer must be configured to be at least two seconds less than the ISDN interdigit timer (T302). Otherwise, the calls are rejected if the T302 times out first.

Interworking Notification

Direct Interworking

When “direct interworking” occurs, the EuroISDN trunk terminates directly on the analog trunk. As a result, the CALL PROCEEDING message is sent to indicate that no further called party information is required. No further call control message is initiated by the analog trunk until answer supervision is provided. If the trunk is a supervised trunk, the resulting CONNECT message will permit the Public Switched Telephone Network (PSTN) to start charging the caller. However, an unsupervised trunk may also be called. In this case, the CONNECT message is sent upon the expiry of the pseudo answer supervision timer.

The destination non-ISDN trunk may be busy instead of ringing; therefore, it is not effective to provide an ALERTING message, since the PSTN provides the caller with ringback. However, the PSTN will be running a T310 timer. Expiry of this timer causes call clearing, and a message must be provided.

The following three alternatives can be configured in Overlay 16 by responding to the PROG prompt to stop the network T310 timer:

1 A PROGRESS message is sent to the network after the CALL PROCEEDING message.

2 An ALERT message is sent to the network after the CALL PROCEEDING message.

3 A CONNECT message is sent to the network after the CALL PROCEEDING message.

Tandem Interworking

When tandem interworking occurs, the EuroISDN trunk terminates on an ISDN link terminating on an analog trunk. When the tandem SETUP message is sent, the CALL PROCEEDING message is sent to the PSTN to indicate that no further called party information is required. The tandem ISDN link returns a PROGRESS message, indicating interworking with a non-ISDN trunk.

Since the PSTN does not implement Annex N, proposed by ETSI, it runs a T310 timer. A message must be provided to stop the T310 timer.

The following three alternatives can be configured in PROG prompt LD 16 to stop the network T310 timer:

1 A PROGRESS message is sent to the network after the CALL PROCEEDING message.

2 An ALERT message is sent to the network after the CALL PROCEEDING message.

3 A CONNECT message is sent to the network after the CALL PROCEEDING message.

When interworking with an analog trunk without answer supervised signaling, the Meridian 1 should be configured to send a CONNECT message rather than an ALERT message. An ALERT or CONNECT message stops the receipt of digits, which implies that all digits have been received.

Networking Features

Some networking features currently exist on more than one ISDN interface implemented on the Meridian 1. These features are listed in Table 53. Any networking feature that does not appear in the table is only supported on one ISDN interface and is rejected by the gateway when the service is requested. That is the case for all Meridian Customer Defined Network (MCDN) features that are not supported over the EuroISDN or QSIG interface.

Table 53
Networking features supported by more than one ISDN interface

	Euro-ISDN	MCDN	QSIG	ETSI BRI sets	DPNSS1	MFC	DTI2	Analog
Calling Line ID	Yes	Yes	Yes	Yes	Yes	No	No	No
Connected Number	Yes	Yes	Yes	No	Yes	No	No	No
Transit Counter	No	Yes	Yes	No	Yes	No	No	No

Transfer of Unanswered Call

The EuroISDN Continuation Phase III feature supports the Transfer of an Unanswered Call feature. This allows a station (an attendant or set) to transfer an unanswered outgoing EuroISDN call, after dialing has been completed and before the transferred-to set answers (while the set is ringing). The transferred-to set may be local, or may be remote if the link is an MCDN link equipped with Network Attendant Services (NAS), or if the link is a QSIG link equipped with Slow Answer Recall.

> ***Note:*** The trunk type for the EuroISDN link must be either CO, DID, TIE, FEX, or WATTS for this functionality to work. Otherwise, the transferred-to set must answer before the transfer can be done.

The transfer of an unanswered EuroISDN call interacts with the CDR feature. When the originating party completes the call transfer after the transferred-to set answers, a CDR Start (S) is generated when the transferred-to set answers. When one side releases the call, a CDR End (E) ticket is generated. If the originating party completes the transfer while the transferred-to set is ringing, an S ticket will be generated only when the transferred-to set answers.

Virtual Network Services

A EuroISDN link can be used as a B-Channel for the Virtual Network Services feature.

Feature packaging

EuroISDN Continuation is included in EuroISDN (EURO) package 261.

For Primary Rate Interface (PRI), the following software packages are required:

- Digit Display (DDSP) package 19
- Integrated Services Digital Network (ISDN) package 145
- 2.0 Mbit Primary Rate Interface (PRI2) package 154
- Integrated Services Digital Network Supplementary Features (ISDN INTL SUP) package 161
- International ISDN PRI (IPRA) package 202
- Multi-purpose Serial Data Link (MSDL) package 222

For Basic Rate Interface (BRI), the following software packages are required:

- Digit Display (DDSP) package 19
- Integrated Services Digital Network (ISDN) package 145
- Integrated Services Digital Network Supplementary Features (ISDN INTL SUP) package 161
- International ISDN PRI (IPRA) package 202
- Meridian 1 Extended Peripheral Equipment (XPE) package 203

- Basic Rate Interface (BRI) package 216
- Integrated Services Digital Network Basic Rate Interface Trunk Access (BRIT) package 233

Overlap Signaling is included in (OVLP) package 184. For the Uniform Dialing Plan (UDP), the following packages are also required:

- Basic Routing (BRTE) package 14
- Digit Display (DDSP) package 19
- Network Call of Service (NCOS) package 32
- Basic Alternate Route Selection (BARS) package 57 or Network Alternate Route Selection (NARS) package 58 (for the Uniform Dialing Plan).

For the Coordinated Dialing Plan (CDP), package 59 and the following packages are required:

- Integrated Services Digital Network (ISDN) package 145
- 2.0 Mbit Primary Rate Interface (PRI2) package 154
- Flexible Numbering Plan (FNP) package 160
- Integrated Services Digital Network Supplementary Features (ISDN INTL SUP) package 161
- International Primary Rate Access (IPRA) package 202

The following packages are required for EuroISDN to interact with Multifrequency Compelled Signaling (MFC), Multifrequency Compelled Signaling for Socotel (MFE), Direct Inward Dialing (DID), Digital Access Signaling System #2 (DASS2), and Digital Private Network Signaling System #1 (DPNSS1):

- Universal ISDN Gateway (UIGW) package 283
- Enhanced DPNSS1 Gateway (DPNSS189I) package 284

The following packages are required for the Numbering Plan Identification (NPI) and Type of Number (TON) fields in CDR:

- Call Detail Recording (CDR) package 4

- Call Detail Recording on Teletype Terminal (CDR_TTY) package 5
- Calling Line Identification in Call Detail Recording (CLID_CDR_PKG) package 118
- New Format for Call Detail Recording (CDR_NEW) package 234

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 15 – Configure the Optional Sending of Forwarding CLID functionality (in response to the OCLI prompt).

2 LD 17 – Create a new D-channel for the EuroISDN interface.

3 LD 16 – Configure new DID routes (the same responses to the IFC and CNTY prompts, as were used in LD 17, must be entered).

4 LD 17 – Configure the Numbering Plan Identification (NPI) and Type of Number (TON) fields to be included in the CDR tickets, in addition to the CLID, for EuroISDN calls (this is automatically done by entering YES in response to the CLID prompt).

LD 15 – Configure the Optional Sending of Forwarding CLID functionality (in response to the OCLI prompt).

Prompt	Response	Description
REQ:	CHG	Change existing data.
TYPE:	NET	Networking data.
CUST	xx	Customer number.
...		
ISDN	YES	Integrated Services Digital Network.
PNI	(0)-32700	Private Network Identifier.
...		
SATD	0-(1)-5	Satellite Delays.

OCLI	(NO)	NO = No manipulation is done on outgoing CLID for calls forwarded over EuroISDN links.
	EXT	EXT = The last forwarding DN is sent as CLID information for incoming calls over a standard ISDN (EuroISDN, APAC, NI-2) DID or CO link to a gateway Meridian 1 node, and redirected back over the standard ISDN (EuroISDN, APAC, NI-2) DID or CO link.
	ALL	ALL = The same as for EXT. Moreover, the last forwarding DN is sent as CLID information for internal calls from a local set or over ISDN TIE trunks, except for DPNSS1 calls which are redirected from a gateway node over a standard ISDN (EuroISDN, APAC, NI-2) DID or CO link. If the redirection does not occur at the gateway node, the redirecting information number, if present in the incoming SETUP message received at the gateway node from the private network, is sent as CLID.
....		

LD 17 – Create a new D-channel for the EuroISDN interface.

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	ADAN	Action Device and Number.
- ADAN	NEW DCH x	New D-channel at port number x.
- CTYP	MSDL	Card type, where MSDL = Multipurpose Serial Data Link for Meridian Options 51C-81C, or Downloadable D-Channel Board for Option 11C.
- GRP	0-4	Network Group Number.
- DNUM	0-15	Device number for I/O ports.
- PORT	0-3	Port number on MSDL card.
- USR	PRI	D-channel for ISDN PRI only. Precede with X to remove.
- IFC		DCH interface type.
	EURO	EURO = EuroISDN

- - CNTY		Enter country pertaining to EuroISDN interface.
	AUS	Austria
	DEN	Denmark
	(ETSI)	ETS 300-102 basic protocol
	FIN	Finland
	GER	Germany
	ITA	Italy
	NOR	Norway
	POR	Portugal
	SWE	Sweden
	EIR	Ireland
	DUT	Holland
	SWI	Switzerland
	BEL	Belgium
	ESP	Spain
	UK	United Kingdom
	FRA	France
	CIS	Commonwealth of Independent States (Russia and the Ukraine).
PINX_CUST	xx	The customer number used for the DN address.
...		
DCHL	0-159	The PRI loop number for the D-Channel.
- - CNEG	(1) 2	Channel Negotiation option. (1) = Channel is indicated and no alternative is acceptable. This is the default value for all EuroISDN Interfaces except FRA. 2 = Channel is indicated and any alternative is acceptable. This is the default value for the FRA interface.
- RCAP	COLP	Enter COLP to support Connected Line Identification Presentation as a remote capability. This is the default value for the ESIG, ISIG, NI2, and EURO interfaces.
	XCOL	Enter XCOL to remove Connect Line Identification Presentation as a remote capability. This is the default value for the APAC, AUS, EIR, DEUT, ESP, BEL, and FRA interfaces.

LD 16 – Configure new DID routes (the same responses to the IFC and CNTY prompts, as were used in LD 17, must be entered).

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change or delete existing data.
TYPE	RDB	Route Data Block.
CUST	xx	Customer number.
ROUT	0 - 511 0-127	Route Number. For Option 11C.
TKTP	 DID COT	Trunk type. DID = Direct Inward Dialing COT = Central Office.
...		
DTRK	YES	Digital trunk route.
- DGTP	 PRI2 BRI	Digital trunk type for route. 2.0 Mb Primary Rate Access. ISDN Basic Rate Access.
...		
- IFC	 EURO	Interface type. EURO = EuroISDN.

- - CNTY		Enter country pertaining to EuroISDN and Asia Pacific interface type.
	AUS	Austria
	DEN	Denmark
	(ETSI)	ETS 300-102 basic protocol
	FIN	Finland
	GER	Germany
	ITA	Italy
	NOR	Norway
	POR	Portugal
	SWE	Sweden
	EIR	Ireland
	DUT	Holland
	SWI	Switzerland
	BEL	Belgium
	ESP	Spain
	UK	United Kingdom
	FRA	France
	CIS	Commonwealth of Independent States (Russia and the Ukraine).
ICOG	IAO	Incoming and Outgoing trunk.
	OGT	Outgoing trunk only.
	ICT	Incoming trunk only.
ACOD	x..x	Access code for this trunk route.

- CLID	OPT0	Prefix = 0, for North American dialing plan. This is the default value for ESIG and ISIG interfaces.
	OPT1	Prefix = 1, for international PFXs in CLID, any numbering type supported. This is the default value for all EuroISDN interfaces.
	OPT2	Prefix = 2, for international PFXs in CLID, CCITT numbering type supported: UKWN, INTL, NPA, and NXX. Default value for CO/DID routes for the Telecom New Zealand interface.
	OPT3	Prefix = 3, for international PFXs in CLID, only NXX number type supported. Default value for TIE routes for the Telecom New Zealand interface.
	OPT4	For international COs, if the call originates from a CO trunk type, add nothing. Otherwise, add PFX1 and PFX2. This is the default value for the Hong Kong, Singapore, and Thailand interfaces.
	OPT5	This is the same as OPT4, except it supports a maximum of 10 digits in the CLID. This is the default value for the Austrian interface.
- PROG		Progress Signal.
	NCHG	Send PROGRESS (default value for all interfaces, except Austria).
	MALE	Send ALERT after CALL PROCEEDING.
	MCON	Send CONNECT after CALL PROCEEDING (this is the default value for the Austrian interface).
...		
- RCAP	COLP XCOL	Enter COLP to support Connected Line Identification Presentation as a remote capability. This is the default value for the ESIG, ISIG, NI2, and EURO interfaces. Enter XCOL to remove Connect Line Identification Presentation as a remote capability. This is the default value for the APAC, AUS, EIR, DEUT, ESP, BEL, and FRA interfaces.
...		

- CPFXS	(YES) NO	Customer-defined Prefixes option. This prompt is added as one of the sub-prompts of ISDN = YES. It is added at the end of the ISDN sub-prompts. If CPFXS = YES, when constructing the Calling or Connected Line Identification, the prefixes are retrieved from the Customer Data Block via the PFX1 and PFX2 prompts in LD 15, as is currently done. This is the default response. If CPFXS = NO, when constructing the Calling or Connected Line Identification, the prefixes are retrieved from the Route Data Block via the HNTN and HLCL prompts in LD 16.
- - HNTN	0-9999	Home National Number. This number is similar to the PFX1 number prompted in LD 15. It is added to this overlay so that this prefix can be configured on a route basis as required in some countries (e.g., Italy). As is the case with PFX1, the HNTN prefix can be from one-to-four digits long. This prompt is displayed only if CPFXS = NO. If only a <CR> is entered, this prompt keeps its previous configuration. If no value was configured previously, no value will be configured. Enter X to delete the digits.
HLCL	0-9999	Home Location Number. This number is similar to PFX2 number prompted in LD 15. It is added to this overlay so that this prefix can be configured on a route basis as required in some countries (e.g., Italy). As is the case with PFX2, the HLCL prefix can be from one-to-four digits long. This prompt is displayed only if CPFXS = NO. If only a <CR> is entered, this prompt keeps its previous configuration. If no value was configured previously, no value will be configured. Enter X to delete the digits.
ADDP	(NO)	If ADDP = NO, the Calling or Connected Party Number displayed is not modified.
	YES	If ADDP = YES, the prefixes 0 (national) or 00 (international) are added to the Calling Party Number if the Type of Number (TON) is public.

LD 17 – Configure the Numbering Plan Identification (NPI) and Type of Number (TON) fields to be included in the CDR tickets, in addition to the CLID, for EuroISDN calls (this is automatically done by entering YES in response to the CLID prompt).

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	PARM	Change system parameters.
...		
- FCDR	NEW	Format for Call Detail Recording. Enter NEW for new format.
...		
- CLID	(NO) YES	Enter YES to include the TON and NPI fields in the CDR ticket, in addition to the CLID.
...		

Feature operation

No specific operating procedures are required to use this feature.

EuroISDN ETS 300 403 Compliance Update

Contents

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Feature description

The EuroISDN feature was initially introduced to provide ISDN PRI and ISDN BRI connectivity between the Meridian 1 and Public Exchanges that comply to the European Telecom Standards Institute (ETSI) specification ETS 300 102 for the Layer 3. The interfaces provided by this feature complied with the country-specific Application Documents for Austria, Denmark, Finland, Germany, Holland, Ireland, Italy, Norway, Portugal, Sweden, and Switzerland (only ISDN BRI connectivity).

The EuroISDN continuation feature expanded the scope of the original EuroISDN feature to provide application support for Belgium, Spain, Switzerland (ISDN PRI connectivity added to the ISDN BRI connectivity), and the United Kingdom.

EuroISDN Continuation Phase III, added France, Russia and the Ukraine to the list of countries having country-specific Application Documents comply with ETS 300 102 for EuroISDN.

The EuroISDN ETS 300 403 Compliance Update feature has been introduced to provide ISDN Primary Rate Interface and Basic Rate Interface to Central Offices that comply with the ETS 300 403-1 European Telecom Standards Institute (ETSI) standard.

Note: In order to support countries that have not yet upgraded to the ETS 300 403 standard, the Meridian 1 still interworks with Central Offices conforming to the ETS 300 102 standard. So, when programming the D-Channel for PRI2 trunks (in LD 17) or a PRI2 route for ISDN trunks (in LD 16) for an ETS 300 403 interface, the following applies:

- If IFC = E403 and CNTY = ETSI (ETS 300 403 for the user side) or NET (ETS 300 403 for the network side), then the interface is fully compliant with ETS 300 403.
- If IFC = E403 and CNTY = any of the supported country entries except ETSI and NET, then the interface behaves like an ETS 300 102 extended version, that is, in addition to the existing ETS 300 102 capabilities, the bearer capability and High Layer Compatibility selection procedures (fall-back mechanism), and the basic telecommunication service identification are also implemented in order to take advantage of teleservices offered, such as 7kHz telephony and Videotelephony.

  Also note that a user may still configure an interface fully compliant with the ETS 300 102 standard if IFC = EURO and CNTY = any of the supported country values.

With the EuroISDN ETS 300 403 Compliance Update feature, all of the functionalities provided by the previous offerings of the EuroISDN features are supported, along with the following enhancements:

- Support for signalling procedures for bearer capability and High Layer Capability selections by, providing repeatable Bearer capability, High layer compatibility Information Elements (IEs) in the SETUP message. ALERT, CALL PROCEEDING, CONNECT, and PROGRESS messages can be used to confirm the selected Bearer Capability/High Layer compatibility for the called user.
- This enhancement provides high-quality bearer services or teleservices, with alternate bearer capability or high layer compatibility in case of fall-back.
- Support for Basic telecommunication service identification. Each basic telecommunication service has the required Bearer capability IE encoding and, if applicable, the required High Layer compatibility IE encoding defined for that service. The requested teleservice is identified by taking the presented Bearer capability and High layer compatibility information elements in all combinations. If there is no valid combination, the presented Bearer Capability IE is considered in order to identify a bearer service.

The following section summarizes the existing EuroISDN functionalities that are supported by the EuroISDN ETS 300 403 Compliance Update feature.

Existing EuroISDN functionalities supported by the EuroISDN ETS 300 403 Compliance Update feature

The ETSI GF subset provides the following two types of functions to the supplementary services control entities:

- Bearer-related transport with a point-to-point transport mechanism. This service is used for the transport of supplementary service protocol information in association with a basic call.
- Bearer-independent transport with a point-to-point facility. This service is used for the transport of supplementary service protocol information which are entirely independent of any existing basic calls.

Note: The ETSI GF does not by itself control any supplementary service but rather provides a generic transport platform that will support ETSI compliance supplementary services. The ETSI Generic Functional protocol is implemented for all ETSI interfaces.

The following call services are supported by the Meridian 1 on the EuroISDN connectivities:

- Basic call service (3.1 kHz, speech, unrestricted digital information).
- 64 kbps bearer capability.
- DID, DOD, COT and TIE call types.
- Channel negotiation.
- Enbloc dialing.
- Overlap sending and Overlap receiving.
- Flexible numbering plan.
- Calling Line Identification Presentation and Calling Line Identification Restriction.
- Connected Line Presentation and Connected Line Restriction.
- MCID (Malicious Call Identification).
- Call Completion to a Busy Subscriber (CCBS).
- 7 kHZ telephony (with fall-back to 3.1 kHz).
- Videotelephony.
- Advice of Charge.

Table 54 summarize the networking features supported at gateways with the EuroISDN connectivity.

Any feature that is not listed in this table is not supported at gateways with EuroISDN connectivity. A “YES”/ “NO” indicates that the gateway is/is not supported. A “NS” indicates the service is not supported on the specified interface.

Table 54
Networking features supported by more than one ISDN interface

	Euro-ISDN	MCDN	QSIG	ETSI BRI sets	DPNSS1	MFC	DTI2	Analog	CIS	KD3
Calling Line ID	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No[4]
Connected Number	Yes	Yes	Yes	No	Yes	No	No	No	No	No[4]
Transit Counter	No	Yes[1]	Yes[2]	No	Yes[3]	No	No	No	No	No[4]

Note 1: This is supported using the ICCL tandem count feature existing over the NAS feature.

Note 2: This is only supported for ETSI version of QSIG. For the ISO version, it is discarded.

Note 3: This is supported using the Loop Avoidance supplementary service.

Note 4: The basic call is not supported at the gateway.

The following functionalities are available for EuroISDN interfaces. When not specified these functionalities are networkwide:

- Intercept Treatment on reception of invalid or incomplete called party number.
- Interception to an Attendant for incoming EuroISDN voice calls terminating on a data set.
- Capability to listen to Tones and Announcements provided by the Central Office on call clearing.

- Capability of Transferring outgoing EuroISDN calls after completion of dialling (applies only for Italy).
- Calling Line Identification and Connected Line Identification transparency to/from EuroISDN to/from a BRI set.
- Connected Line Presentation service configurable on a per D-Channel basis as a remote capability.
- Capability of providing 3.1KHz audio bearer capability for outgoing fax calls, based on a Class of Service assigned to a 500/2500 set.
- Capability of defining bearer capability “Speech” or “3.1KHz” on a system basis (this functionality is also provided on ISDN interfaces).
- Addition and display of National or International Prefix on top of the received Calling/Connected Line Identification on incoming/outgoing EuroISDN calls.
- Flexible National and Local prefixes addition in the Calling/Connected Line Identification for outgoing/incoming calls, based on the route configuration.
- User to User information transparency in call control message (only for EuroISDN trunk interfaces).
- Called party number size increase to 31 octets.
- Capability of mapping a PROGRESS message or a Progress Indicator in the CALL PROCEEDING message, into an ALERT or a CONNECT message on a per configuration basis.
- Capability of using different options to build the CLID.
- Capability of sending a RELEASE message to a BRI set, with cause and Progress Indicator (PI) Number 8. The user is provided with display of cause in addition of tone, for the following scenarios:
  - — internal BRI set originating call to busy or invalid DN.
  - — when receiving a disconnect message from the Central Office via EuroISDN (if a Progress Indicator (PI) Number 8 is not present in the disconnect message, tone is provided locally. Otherwise, inband tone is remotely provided).
  - — when receiving a disconnect message over an MCDN network.

- Capability of immediately releasing rejected BRI data calls without providing tone provision to the BRI terminal.
- Capability, on a per configuration basis, of sending last forwarding DN as a CLID information, for the following types of calls:
  - — incoming EuroISDN calls being forwarded back to the public network via EuroISDN.
  - — incoming MCDN/QSIG calls forwarded to the public network via EuroISDN.
  - — internal calls (stand-alone case) being forwarded to the public network via EuroISDN.
- Trunk optimization before call establishment (TRO) is enhanced for incoming EuroISDN calls.
- The Type Of Number (TON) and Numbering Plan Identification (NPI) are included in CDR tickets, when the configuration record parameter CLID is set to YES and when the configuration record parameter FCDR is set to NEW. This allows incoming calls to be billed to different accounts according to the originator of the call. The TON and NPI are required, since the CLID provides a sequence of digits that could be the same for a local, national or international number.
- The EuroISDN interface also provides interworking with other ISDN or non-ISDN interfaces, such as existing ISDN Central Office connectivities (AXE10, 1TR6, SYS12, Numeris and Swiss Net 2), MCDN (1.5 and 2.0 Mbps), QSIG, DPNSS1, DASS2, R2MFC, MFE, DTI, DTI2 and analog trunk interfaces.
- Layer 1 and layer 2 compliance with ETSI requirements are also supported.

Operating parameters

The EuroISDN feature does not support non-Downloadable D-Channel cards (an NT6D80 MSDL or NTBK51AA Downloadable D-Channel card is required on Options 51C, 61C, 81C, and the NTBK51BA Downloadable D-Channel card is required on the Option 11C).

Operating parameters pertaining to Call Control Procedures:

- If more than one Channel Identification IE is received in a SETUP message, only the first one is used by the Meridian 1. If it is not available, the call is processed as per the channel negotiation configuration. The call is released if no negotiation is allowed. The transfer of a unanswered EuroISDN call to a remote ringing set requires disconnect supervision on the TIE trunk. If the disconnect supervision is not available, after the external user hangs up, the trunk could be locked out. It is the craftsman's responsibility to ensure that the trunks used for this type of call actually have disconnect supervision.

Operating parameters pertaining to ETS 300 102:

- The user-to-user compatibility checking, by the means of the Low Layer compatibility IE and/or the High Layer compatibility IE, is not supported. The LLC IE and the HLC IE are tandemed by the Meridian 1, but this information is not used to perform any checking on a Meridian 1 node.
- Transit network selection is not supported. This IE is normally used by the user to identify a selected transit network in the SET-UP message. As no European country specifies the coding to use this IE, this service is not supported by the Meridian 1. As a result, this IE is never sent by the Meridian1.
- Extension for symmetric call operation is not supported. This is normally used to implement a private network application.
- Network specific facility selection procedures are not supported.
- D-Channel backup procedures are not supported by EuroISDN.
- Message segmentation procedures are not supported. These are normally used to split messages that are too long.
- Low Layer Information coding principle is not checked by the Meridian 1. No LLC is generated by the Meridian 1, but this information is tandemed if received (from an ISDN BRI set for example).
- Low layer compatibility negotiation procedures are not supported.
- The USER INFORMATION message is not implemented in the Meridian 1 software.

Operating parameters pertaining to ETSI GF:

- ETSI GF gateways to and from other signalling systems, such as DPNSS1, QSIG, and MCDN, are not supported.
- The following ETSI GF procedures are not implemented:
  - control of supplementary services using the separate message approach (HOLD/RETRIEVE).
  - bearer-related broadcast transport mechanism (multipoint configuration).
  - bearer-independent point-to-point connectionless transport mechanism.
  - bearer-independent broadcast transport mechanism.
  - generic notification procedures.
  - network-side channel reservation function.
  - generic procedures for supplementary service management.
  - generic status request procedure.
  - support of the Extended facility information element.
- DN address translation requires the association with a customer number. For an ETSI basic call establishment, the customer number association is found through the B-Channel identified in the channel ID IE. For DN address translation that is not associated with a basic call, the customer number association needs to be determined through other methods.
- For a BRI trunk DSL interface, there is a customer number association with the D-Channel. For a PRI interface, a prompt is added for an ETSI D-Channel configuration to create a customer number association with a given D-Channel. This implies that bearer independent messages on a primary rate D-Channel are associated with a single customer as configured in overlay 17. For example, in a multi-customer configuration, if every customer on the switch wishes to use the bearer-independent transport service over ETSI PRI interfaces, then each customer requires a separate D-Channel.

- The Facility Information Element (FIE) is a repeatable IE, and its length is application dependent. However, due to system capacity considerations, such as call register usage and real time usage, there are two types of limitations enforced by the ETSI GF transport platform (actually by the ISDN GF transport platform provided by the ISDN QSIG GF development):

  — the Meridian 1 ETSI GF platform supports up to a maximum of eight ROSE components in one message.The eight components may be included in one Facility Information Element (FIE), or multiple FIEs. In addition, the inclusion of components in a message is also limited by the “available message length”. The available message length is the difference between the maximum message length (260 octets), and the maximum message length taken up by other mandatory and optional IEs supported in the given message.

  — when a supplementary service requests the ISDN ETSI GF transport to send a component which exceed the available message length or the number of components supported, the supplementary service will be notified.

Operating parameters pertaining to ETS 300 403:

- The operating parameters pertaining to ETS 300 102 are applicable to ETS 300 403, except for the user-to-user compatibility checking, which is partially supported in some cases. For instance, as in the case of the EuroISDN 7 kHz/Videotelephony teleservices.
- Codeset 4, which is reserved for use by the ISO/IEC standards, has been added to the ETS 300 403 standard. This codeset is currently not used by the Meridian 1. Therefore, it is not supported.
- The fall-back capability for multirate services is not supported.

Feature interactions

Incoming Digit Conversion

The IDC feature provides the availability to convert the incoming digits from a DID route. This feature is supported on the incoming EuroISDN DID routes. Digits received as a called party number are converted if the IDC feature is activated on the route. Digit analysis is then performed on the converted digits by the Meridian 1.

Intercept Treatment on Invalid or Partial Dialing

There are three features that are involved in the treatment of calls with dialling irregularities. These are the Partial Dial Timing (PRDL), the Vacant Number Routing (VNR), and the Intercept features.

The Intercept feature allows calls with dialling irregularities to be routed to a Recorded Announcement, an attendant, or to receive overflow or busy tone. Separate treatments can be specified for DID and TIE trunks, for CDP/UDP calls, or for non CDP/ non UDP calls.

The PRDL feature allows to route non-ISDN DID incoming calls to the attendant after a configurable amount of time has expired, if the received digits cannot lead to the completion of the routing.

The VNR feature allows a call to a vacant number to be routed to another node, where the call is either treated as a vacant number, terminated, or given intercept treatment.

In order to provide as much flexibility as possible in the treatment of calls from a EuroISDN interface with dialling irregularities, the PRDL feature has been enhanced. Once the PRDL feature is activated, instead of automatically routing the call to an Attendant, the call will be given the intercept treatment provided by the VNR and Intercept features.

For the PRDL feature, when applied to EuroISDN trunks, the EOD timer used as the PRDL timer must be at least two seconds shorter than the ISDN interdigit timer (T302 = 15 seconds) used for the VNR and Intercept treatments. The call is rejected if T302 times out first. The VNR feature uses another timer which is the NIT timer. Its value is configurable between 3 - 8 seconds, on a per customer basis.

Every time a digit is received, if the number received is an invalid number, the VNR, and then potentially the Intercept treatment feature, are activated.

- A number is known to be invalid under the following conditions:
- If Enbloc receiving is configured and an incomplete or invalid number has been received.
- If overlap receiving is configured, and if:
  - an invalid number has been received.

— an incomplete number with a Sending complete IE has been received.

- If the number received is not completed and not yet invalid, one of the following timer is started:
  - — EOD timer (if PRDL =YES)
  - — NIT timer for UDP/CDP calls (If PRDL = NO)
  - — T302 timer

Calls within a CDP or UDP Numbering plan

If an invalid number has been received, the PRDL feature is not involved as no timer has been started.

If an incomplete number has been received, and if PRDL is configured, the NIT timer has no effect. If the EOD timer times out before T302 timer, the PRDL feature is activated, otherwise the call is rejected.

Non CDP and Non UDP Calls

During enbloc receiving, if an invalid number is received in the SETUP message, the call is treated by the intercept feature.

During Overlap Receiving, if the SETUP message contains an incomplete/empty Called Party Number with the Sending complete IE, the call is treated by the intercept feature. If PRDL is configured, the EOD timer is started.

Transfer of an Unanswered Call

This improvement of the Call Transfer feature (for Italy only) allows an attendant, and an analog or a digital set to transfer an outgoing EuroISDN unanswered call, after dialling has been completed. completion of dialling is indicated by the receipt of a CALL PROCEEDING or ALERT message. The Transfer can be performed before the internal set (set to which the outgoing call is transferred) answers.

The transfer is allowed if NAS is configured on the MCDN link or if the link is QSIG with Slow Answer Recall configured (RTIM prompt in the CDB). If the trunk type of the EuroISDN link is neither a Central Office, DID, TIE, FEX, or WATTS, the completion of the transfer is possible only after the called party on the remote node has answered the call.

The transfer of an unanswered EuroISDN outgoing call interacts with the CDR feature. When the originating party completes the transfer, a CDR ticket type “S” (Start) is generated as soon as the transferred party answers. If one side releases the call, a second CDR ticket E is generated corresponding to the end of the communication.

If the originating party completes the transfer and both parties are still ringing, the CDR ticket type “S” (Start) will only be generated when the transferred party answers. If the external party answers when the transferred party is still ringing and then disconnects the call, the CDR ticket ‘S ‘and CDR ticket ‘E’ (End) are generated: in this case the orig ID is the transferring set and the Ter ID is the outgoing trunk.

The Recovery of Misoperation during Call Transfer function is applicable, as per normal operation.

For the Break-in feature, the same restrictions as for normal Call Transfer are apply. During the process of transferring a call, the attendant is not able to reach one of the set involved in the transfer operation.

The changes introduced to enable the transfer before answer have an impact on the conference feature. With the introduction of transfer before answer, it is possible to add additional parties to a call before the first party called over a EuroISDN link has answered the call.

The transfer of unanswered call has no impact on the Call Forward No Answer feature.

The transfer of unanswered call has no impact on the Slow Answer Recall feature.

End to End Signalling

End to End Signalling is supported on all outgoing EuroISDN DID routes as soon as the CALL PROCEEDING message with a Progress Indicator is received.

Integrated Services Access

The Integrated Service Access (ISA) is not supported in Europe.

Advice Of Charge

AOC is implemented as part of the AOC for EuroISDN feature.

Call Completion Supplementary Service

Call Completion interacts with Call Transfer over EuroISDN. This interaction is similar to the current Network Ring Again/Network Ring Again on No Answer, and Call Back When Free/Call back When Not in Use implementations. Call Completion Free Notification can only be presented to the Call Completion Originating station and cannot be transferred to any other station. Once the Call Completion call is established, it behaves as a normal call with respect to call transfer.

Call Back Queuing and Off-hook Queuing

This feature is not supported with Overlap Signalling.

Flexible Hotline

This feature is not supported with Overlap Signalling.

Auto Terminate Call

This feature is supported.

Special Dial Tone after Dialed Numbers

Special dial tones after dialed number feature is not supported for incoming calls.

Trunk Route Optimization

The purpose of this functionality is to provide trunk optimization before call establishment to incoming EuroISDN calls. The trunk optimization occurs when, on the MCDN network, the call has been redirected for one of the following reasons: Call Forward All Calls, Call Forward Busy (CFB), Call Forward No Answer (CFNA), or Hunting. This function will be automatically triggered as soon as TRO is configured on the MCDN network.

If the call is not routed inside MCDN Network before T310 expiry (that is, an ALERT or a CONNECT message is sent back to the Central Office), the call will be released by the Central Office, with cause #102 “Recover on Timer Expiry”. This situation will hardly occur since the optimization operation has to last more than T310 seconds (30 to 40 seconds).

> ***Note:*** When TRO is invoked on the redirecting node, a 2s timer is armed and if no response is received from the M1 Gateway node before expiry, TRO invocation is cancelled and the call is normally routed through the redirecting node.

Optional Sending of Forwarding CLID

The Meridian 1 is able, on a per configuration basis, to send the last forwarding DN as CLID information for different scenarios of forwarded calls when the redirection occurs on a gateway node. The functionality is activated for the following redirections: Call Forward All Calls, Call Forward No Answer, Hunt and the two ACD redirections, Night Call Forward and Interflow.

When the redirection does not occur on the outgoing gateway node for calls coming from a private network (MCDN/QSIG) and routed to the public network via DID or Central office, the outgoing CLID is the redirecting number information included in the SETUP message received on the outgoing gateway node and coming from the private network.

This redirecting number information is the first redirecting DN on the last redirecting node.

When no redirecting IE is present, no manipulation is done and the original CLID is propagated on the DID link.

When the functionality is activated, everything occurs as if the redirecting set had initiated the forwarded call. This means that information such as Presentation Indicator, Screening Indicator, Type Of Number and Numbering Plan are modified accordingly.

The Outgoing CLID (OCLI) prompt is defined in LD15, and can take three different values:

- **NO**. No manipulation is done on outgoing CLID for calls forwarded to UIPE DID or Central Office.
- **EXT.** The last forwarding DN is sent as CLID information for incoming UIPE DID or Central Office calls landing on gateway node and forwarded back to EuroISDN link.
- **ALL**. The scenario described above still applies. Moreover, last forwarding DN is sent as CLID for internal calls (MCDN/QSIG/set) redirected from gateway node to the DID or Central Office link. If the redirection does not occur on gateway node, redirecting information number is sent as CLID if present in the incoming SETUP message received on gateway node from private network.

> ***Note:*** *Note:* An incoming DID/Central Office call, routed through a private ISDN network and then redirected back to the PSTN via the DID/Central Office link, is considered as an internal call. Hence, OCLI prompt has to be set to ALL for the outgoing CLID to be manipulated.

The redirecting information number sent over the MCDN link is not the Last Forwarding DN, but the first Redirecting Number on the last node where redirections occur. Therefore, the DN sent as CLID over the DID or Central Office link will be that DN which is not the Last Forwarding DN.

ISDN CLID Enhancement

The ISDN CLID enhancement interacts with the product improvement "Optional Sending of Forwarding CLID". The CLID entry programed against the prime DN key of the forwarding set attached to the gateway node is used to build the outgoing CLID.

Incoming Trunk Programmable CLID

The "Optional Sending of Forwarding CLID" interacts with the feature "Incoming Trunk Programmable CLID". This feature provides the capability to assign a billing number for incoming trunk routes.

Even though "Incoming Trunk Programmable CLID" is configured to send a billing number (such as the ACOD of the MCDN/QSIG route) as the CLID information, the incoming redirecting information number, if known, is used for the outgoing CLID on the DID trunk.

Type of Number and Numbering Plan Identification in CDR tickets

The Type Of Number and Numbering Plan Identification fields are included in CDR tickets.

Numbering Plan Identification will be printed out on the third line of CDR at characters 44 and 45. Type Of Number will be printed out on the third line of CDR at character 47. Even if seven values are actually used by the Meridian 1, as NPI information is coded on four bits in the Calling Party Number Information Element, it is advisable to reserve a two characters printout.

Both fields only appear if the system configuration parameter CLID is set to YES, if the system configuration parameter FCDR is set to NEW and if there is an incoming ISDN trunk involved in the call. This means that both NPI and TON information are taken from the incoming trunk.

For non ISDN trunks as well as for sets, two blank characters are output for the NPI field and one blank character is output for the TON field. Blank characters are also output if the system configuration parameter CLID is set to NO. If the system configuration parameter FCDR is set to OLD, the fields do not appear, whatever the value of CLID parameter.

Customer Controlled Routing

A call request for telephony 7 kHz or videotelephony teleservice terminating on a Control DN (same as an ACD DN) follows the same rules as for a Meridian proprietary set, that is, fall-back occurs if allowed, otherwise the call is rejected.

Call Detail Recording

The “Optional Sending of Forwarding CLID” interacts with the CDR feature. The CLID field in the generated CDR ticket for the forwarded outgoing EuroISDN call is modified exactly the same way as the CLID information in the SETUP message.

Meridian Link

The CLID generated for DISA and incoming trunks is sent to the Meridian Link application. The prefixes 0/00 added to the display of the CLID are not sent to the Meridian Link.

Meridian Mail

The CLID generated for DISA and incoming trunks is sent to the Meridian Mail application. The prefixes 0/00 added to the display of the CLID are not sent to the Meridian Mail.

Virtual Network Service

VNS provides ISDN features when no MCDN link is available between two Meridian 1 switches. This can be used when analog links are available, or when ISDN links that provide no supplementary services are used. The existing link is used as a B-Channel, and a separate D-Channel handles the MCDN signalling between the two end switches.

A EuroISDN link can be used as a B-Channel for the VNS feature.

Commonwealth of Independent States Phase II, MF Shuttle

The gateway between EuroISDN and the CIS MF Shuttle is supported.

Interworking with KD3

No interworking with KD3 is supported.

Advice Of Charge

Network Call Transfer, Network Call Redirection

Advice of Charge is not supported network wide. If a call is transferred to another Meridian 1 node, the charging information is stored against the Route meter. Relevant CDR S, X and E records are output on the TTY.

Call Completion on Busy Subscriber

The CCBS service is developed on EuroISDN interfaces as an ETSI service. The service is supported for all EuroISDN countries compliant with the ETSI CCBS protocol As a result, each country requires detailed study to insure that the CCBS service offered is compliant with the ETSI CCBS protocol.

EuroISDN Malicious Call Identification

Disconnection of the basic call

On reception of a DISCONNECT message for an incoming EuroISDN trunk which has MCID configured, clearing of the call is delayed until the MCTM timer expires or until the called user goes on-hook.

The MCTM timer will only be started depending on the class of service of the set connected to the EuroISDN trunk. It can also be started if the MTND prompt is configured in the route data block in case of a MCDN to EuroISDN gateway. Otherwise, the connection will not be held.

In band timer (T306)

For an incoming EuroISDN call, a DISCONNECT message is sent from the network side with a Progress Indicator (PI) Number 8, so that the T306 timer should delay the sending of the release message. If for the same call the Malicious Call Trace Timer (MCTM in the Route Data Block, LD 16) is applicable, then it is the T306 timer that takes precedence in order to avoid any in-band information to be cut.

Note: It is recommended that the MCTM timer be configured to a lower value than the T306 timer to avoid any timeout of the T306 timer on the network side.

EuroISDN 7 kHz/Videotelephony teleservices

Telephony 7 kHz and videotelephony teleservices are supported on ISDN BRI Line and EuroISDN interfaces. For any other interface, such as QSIG, MCDN, or DPNSS1, fall-back occurs if allowed. Otherwise, the call is rejected.

Feature packaging

The following packages are required for the EuroISDN ETS 300 403 Compliance Update feature:

- EuroISDN (EURO) package 261
- Multi-purpose Serial Data Link (MSDL) package 222
- International Primary Rate Access (IPRA) package 202
- ISDN Supplementary Features (ISDN INTL SUPP) package 161
- 2.0 Mb Primary Rate Access (PRI2) package 154
- Integrated Services Digital Network (ISDN) package 145
- Digit Display (DDSP) 19

For ISDN Basic Rate Interface Trunking (BRIT), the following additional packages are required:

- ISDN Basic rate Access (BRI) 216
- ISDN Basic Rate Trunk Access (BRIT) package 233
- Meridian 1 XPE (XPE) package 203

For EuroISDN with Overlap Signalling, the following additional packages are required:

- Overlap Signalling (OVLP) package 184
- Flexible Numbering Plan (FNP) package 160
- Coordinated Dialing Plan (CDP) package 59, **or**, if the Uniform Dialing Plan is used, **either**

- Network Alternate Route Selection (NARS) package 58 **or**
- Basic Alternate Route Selection (BARS) package 57
- Network Class of Service (NCOS) package 32
- Basic Routing (BRTE) package 14

For EuroISDN to interwork with MFC, MFE, DID, and DASS2/DPNSS1 gateways, the following additional packages are required:

- New Format Call Detail Recording (FCDR) package 234
- Calling Line Identification in Call Detail Recording (CCDR) package 118
- Call Detail Recording on Teletype Terminal (CTY) package 5
- Call Detail Recording (CDR) package 4

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 16 - Configure a PRI2 loop for the ETS 300 403 interface.

2 LD 17 - Configure a D-Channel for the ETS 300 403 interface.

3 LD 16 - Configure a new route for the E403 interface (the same responses to the IFC and CNTY prompts, as were used in LD 17, must be entered).

4 LD 14 - Configure the PRI2 trunks for the E403 interface.

LD 16 - Configure a PRI2 loop for the ETS 300 403 interface.

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	CEQU	Make changes to Common Equipment parameters.
...		

- PRI2 ...	0-159	PRI2 loop number.

LD 17 - Configure a D-Channel for the ETS 300 403 interface.

Prompt	Response	Description
REQ:	CHG	Change existing data.
TYPE	ADAN	Action Device and Number.
- ADAN	NEW DCH xx	Add a D-Channel on port 0-63 (Options 51C-81C).
	NEW DCH xx	Add a D-Channel on port 0-15 (Option 11C).
...		
- CTYP	MSDL	Card type, where MSDL = Multipurpose Serial Data Link or Downloadable D-Channel card for Meridian Options 51C-81C, or Downloadable D-Channel card for Option 11C.
- GRP	0-4	Network Group Number.
- DNUM	0-15	Device number for I/O ports.
- PORT	0-3	Port number on MSDL card.
- USR	PRI	D-channel for ISDN PRI only. Precede with X to remove.
- IFC	E403	EuroISDN Interface conforming to the ETS 300 403, or the extended ETS 300 102 version for country-specific interfaces. Refer to the Note on page 694.
- - CNTY		Enter country pertaining to the E403 interface. If either ETSI or NET are entered, the interface is fully compliant with ETS 300 403. See the Note on page 694.
	ETSI NET	ETS 300 403 for the user side. ETS 300 403 for the network side.
		If any of the countries listed on the following page are entered, the interface functions with the extended ETS 300 102 capabilities. See the note on page 694.

	AUS DEN FIN GER ITA NOR POR SWE EIR DUT SWI BEL ESP UK FRA CIS	Austria. Denmark. Finland. Germany. Italy. Norway. Portugal. Sweden. Ireland. Holland. Switzerland. Belgium. Spain. United Kingdom. France. Commonwealth of Independent States (Russia and the Ukraine).
...		
- RLS	xx	Software Release of the far-end switch.
- RCAP	aaaa Xaaaa	Remote capabilities. Precede with an X to remove an existing configuration.
- OVLS	(NO) YES	(Do not) allow Overlap Sending.
- - OVLT	(0)-8	Duration of time, in seconds, that the sending side has to wait between INFO messages are sent. “0” means send immediately
- TIMR	(NO) YES	(Do not) change programmable timers. Only supported for interfaces supporting one of the following timers.
- - T310	(30)-100	Maximum time in seconds between an incoming CALL PROCEEDING message and the next incoming message.
- - INC_T306	0-(2)-30	Variable timer, in seconds, for received DISCONNECT message on incoming calls allowing in-band tone to be heard. The network will stop sending after this timer times out. The value is stored in two-second increments, which are rounded up.

- - OUT_T306	0-(30)	Variable timer, in seconds, for received DISCONNECT message on outgoing calls allowing in-band tone to be heard. The network will stop sending after this timer times out. The value is stored in two-second increments, which are rounded up.
- LAPD	(NO) YES	(Do not) change the parameters for the Link Access Protocol the D-Channel.
...		

LD 16 - Configure a new route for the E403 interface (the same responses to the IFC and CNTY prompts, as were used in LD 17, must be entered).

Prompt	**Response**	**Description**
REQ	NEW	Add new data.
TYPE	RDB	Route Data Block.
CUST	xx	Customer number, as previously defined in LD 15. xx = 0-99 for Options 51C-81C. xx = 0-31 for Option 11C.
ROUT	0 - 511 0-127	Route Number for Options 51C-81C. Route Number for Option 11C.
TKTP	 TIE DID COT	Trunk type. TIE. Direct Inward Dialing. Central Office Trunk.
...		
DTRK	YES	Digital trunk route.
- DGTP	PRI2	2.0 MBit/s PRI digital trunk type.
...		
ISDN	YES	Integrated Services Digital Network.
- MODE	PRA	ISDN PRI route.
...		

- IFC	E403	EuroISDN Interface conforming to the ETS 300 403, or the extended ETS 300 102 version for country-specific interfaces. Refer to the Note on page 694.
- - CNTY		Enter country pertaining to the E403 interface. If either ETSI or NET are entered, the interface is fully compliant with ETS 300 403. See the Note on page 694.
	ETSI	ETS 300 403 for the user side.
	NET	ETS 300 403 for the network side.
		If any of the countries listed on the following page are entered, the interface functions with the extended ETS 300 102 capabilities. See the note on page 694.
	AUS	Austria
	DEN	Denmark
	FIN	Finland
	GER	Germany
	ITA	Italy
	NOR	Norway
	POR	Portugal
	SWE	Sweden
	EIR	Ireland
	DUT	Holland
	SWI	Switzerland
	BEL	Belgium
	ESP	Spain
	UK	United Kingdom
	FRA	France
	CIS	Commonwealth of Independent States (Russia and the Ukraine).
ICOG	IAO	Incoming and Outgoing trunk.
	OGT	Outgoing trunk only.
	ICT	Incoming trunk only.
ACOD	xx..x	Access code for this trunk route.

- CLID	OPT0	Prefix = 0, for North American dialing plan. This is the default value for ESIG and ISIG interfaces.
	OPT1	Prefix = 1, for international PFXs in CLID, any numbering type supported. This is the default value for all EuroISDN interfaces.
	OPT2	Prefix = 2, for international PFXs in CLID, CCITT numbering type supported: UKWN, INTL, NPA, and NXX. Default value for CO/DID routes for the Telecom New Zealand interface.
	OPT3	Prefix = 3, for international PFXs in CLID, only NXX number type supported. Default value for TIE routes for the Telecom New Zealand interface.
	OPT4	For international COs, if the call originates from a CO trunk type, add nothing. Otherwise, add PFX1 and PFX2. This is the default value for the Hong Kong, Singapore, and Thailand interfaces.
	OPT5	This is the same as OPT4, except it supports a maximum of 10 digits in the CLID. This is the default value for the Austrian interface.
- PROG		Progress Signal.
	NCHG	Send PROGRESS (default value for all interfaces, except Austria).
	MALE	Send ALERT after CALL PROCEEDING.
	MCON	Send CONNNECT after CALL PROCEEDING (this is the default value for the Austrian interface).
...		
- RCAP	aaaa Xaaaa	Remote capabilities. Precede with an X to remove an existing configuration.
...		

- CPFXS	(YES) NO	Customer-defined Prefixes option. This prompt is added as one of the sub-prompts of ISDN = YES. It is added at the end of the ISDN sub-prompts. If CPFXS = YES, when constructing the Calling or Connected Line Identification, the prefixes are retrieved from the Customer Data Block via the PFX1 and PFX2 prompts in LD 15, as is currently done. This is the default response. If CPFXS = NO, when constructing the Calling or Connected Line Identification, the prefixes are retrieved from the Route Data Block via the HNTN and HLCL prompts in LD 16.
- - HNTN	0-9999	Home National Number. This number is similar to the PFX1 number prompted in LD 15. It is added to this overlay so that this prefix can be configured on a route basis as required in some countries (e.g., Italy). As is the case with PFX1, the HNTN prefix can be from one-to-four digits long. This prompt is displayed only if CPFXS = NO. If only a <CR> is entered, this prompt keeps its previous configuration. If no value was configured previously, no value will be configured. Enter X to delete the digits.
HLCL	0-9999	Home Location Number. This number is similar to PFX2 number prompted in LD 15. It is added to this overlay so that this prefix can be configured on a route basis as required in some countries (e.g., Italy). As is the case with PFX2, the HLCL prefix can be from one-to-four digits long. This prompt is displayed only if CPFXS = NO. If only a <CR> is entered, this prompt keeps its previous configuration. If no value was configured previously, no value will be configured. Enter X to delete the digits.
ADDP	(NO) YES	If ADDP = NO, the Calling or Connected Party Number displayed is not modified. If ADDP = YES, the prefixes 0 (national) or 00 (international) are added to the Calling Party Number if the Type of Number (TON) is public.

LD 14 - Configure the PRI2 trunks for the E403 interface.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	TIE COT DID	TIE trunk data block. Central Office Trunk data block. Direct Inward Dialing trunk data block. ***Note:*** Must match TKTP defined in LD 16.
TN	l ch	Loop and channel for digital trunks, where: l = Previously defined PRI2 loop. ch = channel 1-30
	c u	cu = card and unit, for Option 11C.
CUST	xx	Customer number, as previously defined in LD 15. xx = 0-99 for Options 51C-81C. xx = 0-31 for Option 11C.
RTMB	0-511 1-510 0-127 1-510	Route number and member number, for Options 51C-81C. For Option 11C.
TGAR	0 - (1) - 31	Trunk Group Access Restriction The default of 1 automatically blocks direct access.

Feature operation

No specific operating procedures are required to use this feature.

EuroISDN Malicious Call Identification

Contents

The following are the topics in this section:

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Regional material statement

ISDN BRI trunking is not available in North America. Contact your system supplier or your Nortel Networks representative to verify support of this product in your area.

Feature description

The EuroISDN Malicious Call Identification feature (MCID) allows the source of an incoming call to be identified and recorded by the network side (the Central Office) of a EuroISDN PRI/BRI connection.

This request is initiated by the activation of the Malicious Call Trace feature (MCT) from analog (500/2500) type sets using a SPRE code and a two-digit Flexible Feature MCT access code or from Meridian 1 proprietary sets and attendant consoles using the TRC feature key.

EuroISDN Malicious Call Identification (MCID) can be invoked during the active phase of a malicious call or after the active phase of a malicious call for a limited period of time. Figure 69 illustrates a situation where EuroISDN MCID is initiated during the active phase of a malicious call.

Figure 69
EuroISDN MCID invoked during the active phase of a malicious call

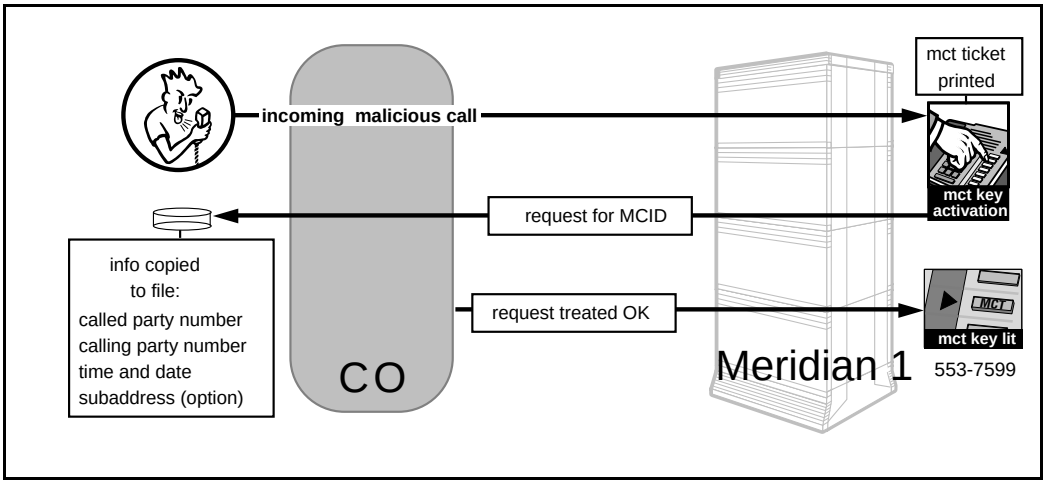
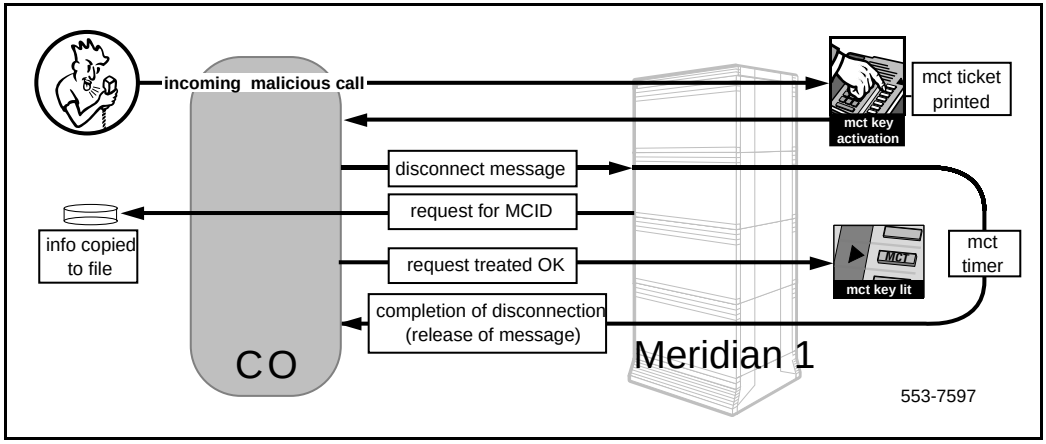


Figure 70 illustrates a situation where EuroISDN MCID is initiated after the active phase of a malicious call.

Figure 70
EuroISDN MCID invoked after the active phase of a malicious call



A report showing the results of MCID request is printed on any system Teletype Terminal (TTY) designated as a maintenance terminal. The report includes an enhanced Malicious Call Trace (MCT) ticket that shows the Number Plan Identifier (NPI) and the Type of Number (TON). A description of these output fields are provided in the section “Malicious Call Trace Record output”.

The required system components of the MCID feature functionality are as follows:

- A Central Office switch supporting EuroISDN PRI/BRI connectivity (This CO is referred to as the network side.)
- A Meridian 1 switch supporting EuroISDN PRI/BRI connectivity
- For tandem applications, another Meridian 1 switch connected to the other over an MCDN link supporting the Malicious Call Trace feature and with Network Attendant Services enabled. In this case, in order for the MCID request to be processed, the gateway switch must be located between the MCDN link supporting MCT and with Network Attendant Service (NAS) enabled, and the EuroISDN Central Office interface.

When the MCID request is initiated via activation of the Malicious Call Trace feature, a MCID request message is sent to the Central Office from the called party node. The Central Office processes the MCID request and returns a message to indicate the successful operation. It registers the following relevant MCID information that is stored by the network operator:

- the called party's directory number
- the calling party's directory number
- the local time and date of invoking call trace on the network serving the called party
- the calling party's sub-address, if provided

Malicious Call Trace Record output

The NPI and TON fields have been added to the print output format, to show the Numbering Plan Identifier (NPI) and the Type of Number (TON) of the Calling Line Identifier field. The MCID ticket printed when the malicious call occurs. The output format is as follows:

MCI/MCE CUST# STAR1 ORIGTN STAR2 TERTN ATTPTY TIME CNI#
STAR1ORIGDN STAR2TERDN NPI TON

> ***Note:*** The second line is printed only if MCDC = YES in Overlay 15, the Customer Data Block. Also, for ISDN trunks, the ORIGDN/TERDN fields in line two are replaced by the CLID# field. Therefore, for ISDN trunks, the output would be as follows:

MCI/MCE CUST# STAR1 ORIGTN STAR2 TERTN ATTPTY TIME CNI#
STAR1CLID# STAR2CLID# **NPI TON**

where, for line 2:

Field	Description
NPI	For ISDN trunks. The Numbering Plan Identifier of the CLID printed above.
TON	For ISDN trunks. The Type of Number of the CLID printed above.

Operating parameters

Malicious Call Trace (MCT) feature is only activated against one call at one time from either a set or an attendant. If a set activates MCT against a call, then the traced call is put on hold and a second call is activated. A trace against the second call cannot be completed until the first call is disconnected. If multiple TRC keys are defined, then this still occurs. The TRC key reflects the status of the MCT activation.

This feature is not supported on Basic Rate Interface (BRI) sets. However, it is supported over ISDN BRI trunks.

Soft keys cannot be defined as a TRC key on Meridian 1 2317, 3000 or 5317 digital sets.

For Options 51C-81C, the EuroISDN Malicious Call Identification requires the following hardware:

- For Primary Rate Access, the NT6D72 PRI card or the NTCK43 Dual PRI card
- For D-Channel processing, NT6D80 the Multi-Serial Data Link (MSDL) card, or the NTBK51 two-port Downloadable D-Channel Daughterboard (DDCH) with the NTCK43 DPRI instead of an MSDL card
- For Basic Rate Access, the NT6D73AA MISP card and the NT6D70BA SILC card for trunk access

For Option 11C, the EuroISDN Malicious Call Identification requires the following hardware:

- For Primary Rate Access, the NTBK50AA PRI card
- For D-Channel processing, the NTBK51BA Downloadable D-Channel Daughterboard
- For Basic Rate Access, the NTBK22AA MISP card and the NT6D70BA SILC card for trunk access

When EuroISDN Malicious Call Identification is configured on a set, the Attendant Administration feature cannot modify this feature.

Feature interactions

Call Detail Recording

If a DISCONNECT message is received from an incoming EuroISDN call and the Malicious Call Trace time is started, then this timer delays the output of the Call Detail Recording (CDR) record. This will not occur if the called party's set goes on-hook.

Malicious Call Trace

EuroISDN Malicious Call Identification (MCID) is based on the existing Malicious Call Trace (MCT) feature. The existing MCT activation triggers MCID treatments.

Feature packaging

The following packages are required for EuroISDN Malicious Call Identification:

- Malicious Call Trace (MCT) package 107
- International Supplementary Features (SUPP) package 131
- Flexible Feature Code (FFC) package 139 for 2500 type sets
- Integrated Services Digital Network (ISDN) package 145
- Multipurpose Serial Data Link (MSDL) package 222
- Euro ISDN (EURO) package 261
- Universal ISDN Gateway (UIGW) package 283
- Euro Supplementary Service (ETSI_SS) package 323

Primary Rate Interface (PRI) connectivity requires the following packages:

- International Primary Rate Access CO (PRA) package 146
- 2.0 Mb Primary Rate Interface (PRI2) package 154
- Integrated Services Digital Network Supplementary Features (ISDN INTL SUP) package 161
- International Primary Rate Access (IPRA) package 202

Basic Rate Interface (BRI) connectivity requires:

- Basic Rate Interface (BRI) package 216
- ISDN Basic Rate Interface Trunk Access (BRIT) package 233

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 17 - Configure remote D-channel capability for EuroISDN interface for PRI and BRI.

2 LD 16 - Configure remote capability for EuroISDN interface for PRI.

3 LD 16 - Configure remote capability for EuroISDN interface for BRI.

4 LD 15 - Modify system and software parameters.

5 LD 10 - Configure analog (500/2500 type) sets.

6 LD 11 - Configure Meridian 1 proprietary sets.

7 LD 12 - Attendant Consoles.

8 LD 57 - Configure Flexible Feature Codes for Analog (500/2500 type) sets.

9 LD 16 - Configure Malicious Call Trace Timer and Tandem Delay.

LD 17 - Configure remote D-channel capability for EuroISDN interface for PRI and BRI.

Prompt	Response	Description
REQ	**CHG**	**Change existing data.**
TYPE	ADAN	Action Device and Number.
- ADAN	CHG DCH xx	Change D-channel.
...		
- IFC	EURO	EuroISDN interface for D-channel.
...		
RCAP	MCID	Add Malicious Call Identification as a new remote capability.

LD 16 - Configure remote capability for EuroISDN interface for PRI.

Prompt	Response	Description
REQ	**CHG**	**Change existing data.**
TYPE	RDB	Route Data Block.
...		
DTRK	YES	Digital Trunk Route.
- IFC	EURO	EuroISDN interface.
...		
RCAP	MCID	Add Malicious Call Identification as a new remote capability.

LD 16 - Configure remote capability for EuroISDN interface for BRI.

Prompt	Response	Description
REQ	**CHG**	**Change existing data.**
TYPE	RDB	Route Data Block.
...		
DTRK	YES	Digital Trunk Route.
...		
- DGTP	BRI	Basic Rate Interface Digital Trunk Type.
- IFC	EURO	EuroISDN interface.
RCAP	MCID	Add Malicious Call Identification as a new remote capability.

LD 15 - Modify system and software parameters.

Prompt	Response	Description
REQ:	**CHG**	**Change existing data.**
TYPE:	FTR	Customer Features and options.
...		
OPT	MCTA	Malicious Call Trace signal is allowed for attendants. MCTD = Malicious Call Trace is denied (default)
...		
MCDC	YES	Malicious Call DN/CLID printing allowed.

LD 10 - Configure analog (500/2500 type) sets.

Prompt	Response	Description
REQ:	**CHG**	**Change.**
TYPE:	500	Telephone type.
TN	l s c u c u	Terminal Number. For Option 11C.
...		
CLS	MCTA	Malicious Call Trace allowed. (MCTD) = Malicious Call Trace denied.

LD 11 - Configure Meridian 1 proprietary sets.

Prompt	Response	Description
REQ:	**CHG**	**Change existing data.**
TYPE:	xxxx	Telephone type, where: xxxx = SL1, 2006, 2008, 2009, 2016, 2018, 2112, 2216, 2317, 2616, 3000
TN	l s c u c u	Terminal Number. For Option 11C.
...		
CLS	MCTA	Malicious Call Trace allowed. MCTD = Malicious Call Trace denied (default).
KEY	xx TRC	Trace key number.

LD 12 - Attendant Consoles.

Prompt	Response	Description
REQ	**CHG**	**Change existing data.**
TYPE	xxxx	Type of Attendant Console.
TN	l s c u c u	Terminal Number. For Option 11C.
...		
CLS	MCTA	Malicious Call Trace allowed. MCTD = Malicious Call Trace denied (default).
KEY	xx TRC	Trace key number.

LD 57 - Configure Flexible Feature Codes for Analog (500/2500 type) sets.

Prompt	Response	Description
REQ	**NEW** **CHG**	**Add new data.** **Change existing data**
TYPE	FFC	Flexible Feature Code data block.
CUST	xx	Customer number.
...		
CODE	MTRC	Malicious Call Trace code
- MTRC	xxxx	Enter Flexible Feature Code for Malicious Call Trace.

LD 16 - Configure Malicious Call Trace Timer and Tandem Delay.

Note: This configuration is only required to handle Malicious Call Trace during call disconnection.

Prompt	Response	Description
REQ	**CHG**	**Change existing data.**
TYPE	RDB	Route Data Block.
...		
MCTS	YES	Malicious Call Trace Signal. (NO) = default.
- MCTM	(0) - 30	Malicious Call Trace Request Timer ID in seconds.
- MTND	YES	Malicious Call Trace disconnect delay for tandem calls on AXE-10 Australia and EuroISDN.

Feature operation

There are no operating procedures specified for this feature. However, the Malicious Call Identification feature is activated by one of the following methods, depending on the station:

- From an analog (500/2500) type set, a switch-hook flash is performed, and then a SPRE code and two-digit Flexible Feature MCT access code are dialed.
- From Meridian 1 proprietary sets, the TRC feature key is pressed.
- From an attendant console, the TRC feature key is pressed.

The following section describes the lamp status associated with the TRC key on Meridian 1 proprietary sets and attendant consoles.

Trace Number (TRC) key lamp status

The TRC key lamp status indicates the progress and success of the Malicious Call Identification request signaling to the CO. The following are the lamp states:

Lamp Winking

When the TRC key is activated, its associated lamp changes from dark to winking if the trunk involved in the call requires the signaling to be done. The lamp remains winking until the call identification request signaling to the CO has been completed.

In a Meridian Customer Defined Network (MCDN) tandem scenario, the lamp on the set which originated the call identification remains winking until a Facility message is received from the node nearest to the Central Office. The user cannot invoke MCT again while the lamp is in the winking state.

Lamp Lit

The lamp state changes from winking to lit If the call identification request to the CO is successful.

In an MCDN tandem scenario, the lamp changes from winking to lit if a Facility message received from the node nearest to the CO indicates that the MCID request was successful. Any further activation of the TRC key during this state is ignored.

Lamp Dark

This lamp state indicates an idle TRC key or failure of the call identification request to the CO.

In an MCDN tandem scenario, the lamp goes from winking to dark if a Facility message received from the node nearest the CO indicates that the MCID request was unsuccessful.

During this lamp state, the TRC key may be activated to initiate the call identification request again.

EuroISDN Trunk - Network Side

Contents

The following are the topics in this section:

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Regional material statement

ISDN BRI trunking is not available in North America. Contact your system supplier or your Nortel Networks representative to verify support of this product in your area.

Feature description

EuroISDN Trunk - Network Side refers to the behaviour of EuroISDN as a network interface (generally referred to as “network side”), where the EuroISDN interface has the behaviour of a terminal interface (generally referred to as the “user side”).

As part of the EuroISDN Trunk - Network Side feature, the following capabilities are provided.

ETSI EuroISDN network side compliance to go along with the ETSI EuroISDN user side compliance. The ETSI EuroISDN network side interface (EuroISDN Trunk - Network Side) provides the capability to connect the ETSI EuroISDN user side interface of a Common Peripheral Equipment (CPE) to the Meridian 1. Another arrangement could be the connection of key systems to a Meridian 1, to form part of the private network.

Similarly, this product also offers a trunk interface for the connection of terminal equipment, such as fax servers, routers and multiplexers, which would normally connect to the public network, but which now can be connected to the Meridian 1 to achieve a greater public network connection efficiency. Such access to the Meridian 1 may be via ISDN Primary Rate Interface (ISDN PRI) or ISDN Basic Rate Interface (ISDN BRI) trunks.

The network side interface provides all feature operations, interactions and gateways that are supported by the user side. It supports the following EuroISDN capabilities:

- Basic call,
- Direct Inward Dialing,
- Sub-addressing,
- Calling Line Identification Presentation (CLIP)/Calling Line Identification Restriction (CLIR)
- Connected Line Identification Presentation (COLP)/Connected Line Identification Restriction(COLR), and
- CCBS.

— User-to-User Signaling 1 (UUS1) information exchange transparency, which allows a calling and a called party to exchange small amounts of data over an ISDN PRI or ISDN BRI trunk's D-Channel. This data is contained in the USER_USER Information Element (IE) within the call control messages.

— Bearer Capability-Based Routing, which allows outgoing calls to be selectively routed (over Central Office, Direct Inward Dialing, or TIE trunks for ISDN routes, and Integrated Digital Access trunks for DPNSS1 and DASS2 routes) based on its Bearer Capability. Any ISDN PRI or ISDN BRI route can be configured (in overlay 16) to be dedicated to handle voice calls only, data calls only, voice with 3.1 KHz, data with 3.1 KHz, or both voice and data with 3.1 KHz.

The following protocols are supported by Bearer Capability-Based Routing:

- EuroISDN
- Asia Pacific
- Numeris
- 1TR6
- SWISSNET2
- AXE10 (for Sweden and Australia)
- SYS12
- D70
- QSIG
- DPNSS1
- DASS2
- MCDN
- All North American ISDN connectivities (Meridian 1 to Meridian 1, Meridian 1 to SL-100, Meridian 1 to DMS-100/250, Meridian 1 to AT&T 4ESS, Meridian 1 to AT&T 4ESS/5ESS).

Operating parameters

The User-to-User transparency capability is only supported between EuroISDN trunks.

The following specific hardware is required on Meridian 1 Options 51C, 61C, and 81C.

For ISDN PRI access:

- The NT8D72BA PRI2 card or the NTCK43 dual-port PRI2 card;
- For D-Channel handling, the NT6D80 MSDL card or the NTBK51BA Downloadable D-Channel Daughterboard (if the NTCK43 dual-port PRI2 card is used);
- QPC414 Network Interface card, if the NT8D72BA PRI2 card; and
- QPC775E (and later vintages) Clock Controller card.

For ISDN BRI access:

- The NT6D73AA MISP card and the NT6D70BA SILC card for trunk access;
- Optionally, the NT6D71 UILC line card (the NT6D71 UILC line card requires ANSI 2B1Q line encoding and a Network Termination 1 (NT1) configuration); and
- The QPC775E (and later vintages) Clock Controller card.

The following specific hardware is required for the Option 11C.

For ISDN PRI access:

- The NTBK50AA PRI2 card;
- The NTBK51BA Downloadable D-Channel Daughterboard; and
- The NTAK20 (vintage BB or later) Clock Controller daughterboard.

For ISDN BRI access:

- The NTBK22AA MISP card and the NT6D70BA SILC card for trunk access.

Feature interactions

Basic Call Gateways

The gateways that are supported for the EuroISDN Trunk - Network Side connectivity are the same as the ones supported for the EuroISDN connectivities. Table 55 lists these gateways and the associated support for basic call functionality.

Table 55
Basic Call Gateways (Part 1 of 2)

Gateway	Basic Call Support
Analog (End-of-Signaling)	Basic Voice Call
DTI2 (End-of-Signaling)	Basic Voice Call Data Call (64K unrestricted)
MFE	Basic Voice Call
KD3	Not supported
R2MFC	Basic Voice Call Calling Line ID transmission (provided by the Tandem Call/CDR feature)
DPNSS1	Basic Voice Call Data Call (64K unrestricted) Calling Line ID transmission
ISDN COs (North American and non-EuroISDN interfaces)	Basic Voice Call Data Call (64K unrestricted) Calling Line ID transmission
EuroISDN and Asia Pacific ISDN	Basic Voice Call Data Call (64K unrestricted) Calling Line ID transmission
NI2	Basic Voice Call Data Call (64K unrestricted) Calling Line ID transmission
QSIG	Basic Voice Call Data Call (64K unrestricted) Calling Line ID transmission

Table 55
Basic Call Gateways (Part 2 of 2)

Gateway	Basic Call Support
MCDN	Basic Voice Call Data Call (64K unrestricted) Calling Line ID transmission
CIS	Basic Voice Call Calling Line ID transmission
Note: For MFE, MFC, and CIS using DTI2, data calls are possible.	

Call Completion to Busy Subscriber

This feature is supported on a EuroISDN Trunk - Network Side connectivity interface.

Call Completion on No Reply

This feature is supported on QSIG and DPNSS1 (as Call Back When Next Used) interfaces, corresponding to the MCDN Network Ring Again on No Answer feature. It is not supported on a EuroISDN Trunk - Network Side connectivity interface.

Calling Line Identification Presentation (CLIP)/Calling Line Identification Restriction (CLIR)

The EuroISDN Trunk - Network Side connectivity can generate, tandem or receive a Calling Line Identification (CLID) with presentation allowed (CLIP) or restricted (CLIR.) A CLID that is generated is constructed in the same manner as the EuroISDN user mode connectivity. A CLID that is received is displayed on the called user's display, if call presentation is allowed.

Even though the EuroISDN Trunk - Network Side connectivity acts as the network side of the Central Office connectivity, it does not provide the network functions (screening and validation) for the Calling Line Identification service.

Connected Line Identification Presentation (COLP)/Connected Line Identification Restriction (COLR)

The EuroISDN Trunk - Network Side connectivity can generate, tandem or receive a Connected Line Identification with presentation allowed (COLP) or restricted (COLR). A Connected Line Identification that is generated or tandemed is constructed in the same manner as the EuroISDN user mode connectivity. A Connected Line Identification that is received is displayed on the called user's display, if call presentation is allowed.

Even though the EuroISDN Trunk - Network Side connectivity acts as the network side of the Central Office connectivity, it does not provide the network functions (screening and validation) for the Connected Line Identification service.

Calling Party Privacy

If a number presentation for a call is blocked by the Calling Party Privacy feature, the CLID, sent over a EuroISDN Trunk - Network Side connectivity, will have the presentation flagged as restricted.

End-to-End Signaling

End-to-End Signaling, which allows in-band dialing to be performed on ISDN trunks before and after the call has been answered, is supported on the EuroISDN Trunk - Network Side connectivity.

In the case of tandem with ISDN trunks, the necessary information to allow the End-to-End Signaling feature is tandemed to the ISDN trunk. At this point, it becomes the responsibility of the end user switch to provide the End-to-End Signaling service.

Incoming Digit Conversion (IDC) Enhancement

This feature is supported on the incoming EuroISDN Trunk - Network Side connectivity DID routes. If IDC is equipped, digits received as a called party number are converted, and digit analysis is then performed on the converted digits.

ISDN CLID Enhancements

The EuroISDN Trunk - Network Side connectivity supports all of the user side ISDN CLID enhancements.

Integrated Services Access (ISA)

ISA is not supported on a EuroISDN Trunk - Network Side connectivity. ISA is currently implemented for the North American ISDN interfaces. ISA allows a B-channel to be configured as a universal trunk. For example, the same B-channel trunk can be used once as a Central Office trunk and the next time as a Direct Inward Dial trunk.

Network Alternate Route Selection (NARS)/Basic Alternate Route Selection (BARS)/Coordinated Dialing Plan (CDP)

For NARS, the Numbering Plan Area (NPA) code and Central Office Code (NXX) cannot be used on the ETSI network side interface, since the codes are not supported by the European public network. Special Numbers (SPNs) get converted to “unknown”, since SPNs are used only in North America. Also, when using Location Codes (LOCs), the networking features do not accept a Digit Manipulation Index (DMI) used to insert an ESN access code. Therefore, the trunks are treated as though they were non-ISDN.

For BARS, the Numbering Plan Area (NPA) code and Central Office Code (NXX) cannot be used on the ETSI network side interface, since the codes are not supported by the European public network. Special Numbers (SPNs) get converted to “unknown”, since SPNs are used only in North America.

For CDP, a CDP call can access a trunk on the EuroISDN Network Side. However, since neither the private number nor a CDP number is supported by the ETSI EuroISDN Trunk - Network Side, they get converted to a type that is supported by public network. This applies to both the called and calling number plan and type. Also, normal usage of steering codes with Distant Steering Codes (DSCs) and Trunk Steering Codes (TSCs) is supported, as is the use of Digit Manipulation Indexes (DMIs).

Network Attendant Service

Network Attendant Service signaling is not supported on a EuroISDN Trunk - Network Side connectivity. However, NAS will interwork with an incoming call from the EuroISDN Trunk - Network Side (routing and call handling).

Network Call Redirection (Call Forward, Call Forward No Answer, Hunt) and Network Call Modification (Conference, Transfer)

It is possible to have a set Call Forward, Call Forward No Answer or Hunt to an external number over a EuroISDN Trunk - Network Side connectivity ISDN PRI or ISDN BRI trunk. It is also possible to transfer or conference a call to an external number over a EuroISDN Trunk - Network Side connectivity ISDN PRI or ISDN BRI trunk. Access restrictions may block some transfers from being completed.

Notices of call redirection or call modification are not transmitted over a EuroISDN Trunk - Network Side connectivity.

Network Call Party Name Display

This feature is not supported on a EuroISDN Trunk - Network Side connectivity.

Name Display

The transport of the name information, which is supported on QSIG interfaces and which corresponds to the Network Calling Party Name Display feature, is not supported on a EuroISDN Trunk - Network Side connectivity interface.

Networking Supplementary Features

The supplementary features that are supported on a EuroISDN Trunk - Network Side connectivity interface are Call Completion to Busy Subscriber, Calling Line Identification Presentation/Restriction, Connected Line Identification Presentation/Restriction and User-to-User Signaling 1 (UUS1) information exchange transparency.

Special Dial Tone After Dialed Numbers

This feature is not supported for incoming calls on the ETSI network side, but it is supported for outgoing calls.

Trunk Optimization

Trunk Optimization is not supported across a EuroISDN Trunk - Network Side interface. Trunk Optimization Before Answer is not supported within an MCDN network, if the call originated from a EuroISDN Trunk - Network Side connectivity interface.

Virtual Network Services

Virtual Network Services is supported on a EuroISDN Trunk - Network Side connectivity, meaning that a EuroISDN Trunk - Network Side trunk can be used as a VNS bearer trunk.

Feature packaging

To support the network side EuroISDN Trunk - Network Side connectivity, EuroISDN Trunk - Network Side feature (MASTER), package 309, is required.

The following software packages are required as dependencies to the MASTER package or are required to support the full capabilities described in this feature module:

- 2.0 Mbit Primary Rate Access (PRI2) package 154;
- Integrated Services Digital Network Supplementary Features (ISDNS) package 161;
- International Primary Rate Access (IPRA) package 202;
- Basic Rate Interface (BRI) package 216;
- Multi-purpose Serial Data Link (MSDL) package 222;
- Basic Rate Interface Trunk Access (BRIT) package 233; and
- EuroISDN (EURO) package 261.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

For ISDN PRI access:

1 LD 17 – For the network side EuroISDN Trunk - Network Side connectivity, configure the D-Channel for the network side EuroISDN ETSI protocol.

2 LD 16 – Configure the ISDN BRI link for the network side EuroISDN ETSI protocol.

For ISDN BRI access:

3 LD 16 – For an ISDN or DPNSS1/DASS2 trunk, configure the route for the Bearer Capability-Based Routing call type.

For ISDN PRI access:

LD 17 – For the network side EuroISDN Trunk - Network Side connectivity, configure the D-Channel for the network side EuroISDN ETSI protocol.

Prompt	Response	Description
REQ	CHG	Change the existing data.
TYPE	ADAN	Action device and number.
- ADAN	CHG DCH x	Change a specified D-Channel. x=0-63, for Option 11 x=0-15.
- CTYP	MSDL	The card type to be used is the MSDL. Card type for Option 11, where MSDL = Downloadable D-Channel Daughterboard.
...		
- IFC	EURO	Interface type. Enter EURO for EuroISDN.
- - CNTY	NET	Country pertaining to EuroISDN interface. Enter NET for network side.
...		

For ISDN BRI access:

LD 16 – Configure the ISDN BRI link for the network side EuroISDN ETSI protocol.

Prompt	Response	Description
REQ	CHG	Change the existing data.
TYPE	RDB	Route Data Block.

CUST	xx	Customer number.
ROUT	xx	Route number.
...		
DTRK	YES	Digital trunk.
...		
- IFC	EURO	Interface type. Enter EURO for EuroISDN.
- - CNTY	NET	Country pertaining to EuroISDN interface. Enter NET for network side.
...		

LD 16 – For an ISDN or DPNSS1/DASS2 trunk, configure the route for the Bearer Capability-Based Routing call type.

Prompt	Response	Description
REQ	CHG	Change the existing data.
TYPE	RDB	Route Data Block.
CUST	xx	Customer number.
ROUT	xx	Route number.
TKTP		Supported trunk type.
	CO	Central Office trunk.
	DID	Direct Inward Dial trunk.
	TIE	TIE trunk.
	IDA	Integrated Digital Access trunk.
...		
DTRK	YES	Digital trunk.

...		
- DSEL		Data Selection.
	(VOD)	Route is for both voice and data
	VCE	Route is voice only
	DTA	Route is data only
	3VCE	Route is voice and 3.1 KHz
	3DTA	Route is data and 3.1 KHz
	TDN	Transparent Data Network

Feature operation

No specific operating procedures are required to use this feature.

Idle Extension Notification

Contents

The following are the topics in this section:

Feature description 749
Operating parameters 749
Feature interactions 751
Feature packaging 754
Feature implementation 754
Task summary list 754
Feature operation 755

Feature description

The Idle Extension Notification feature provides the attendant with the ability to be notified when a busy extension becomes idle. There are several applications for this feature, but the primary one is for an attendant who wants to leave a person an urgent message, but still does not want to break in on an existing call.

The affected Attendant Consoles are: M2250, M1250, QCW4, QCW8 and CD345.

Operating parameters

The following limitations apply for the Idle Extension Notification feature:

- This feature is part of the SACP feature and is dependent on configuring the SACP key on the attendant console.

- The attendant can use Idle Extension Notification for extensions with ordinary HOT/MCN/MCR/SCN/ SCR DNs. It does not work for ACD DNs or PLDNs.
- Only one Idle Extension Notification at a time can be requested for an extension.
- If a call is already camped on (or SACP camped on) to an extension, no Idle Extension Notification can be requested for that extension at the same time and vice versa.
- The SACP customer option SACP = ALL or SNGL in the customer data block is not applicable for Idle Extension Notification. The Idle Extension Notification feature is always performed on a per call basis.
- The Idle Extension Notification feature can only be activated on a first degree busy extension. Generally if Camp-On is not allowed on an extension Idle Extension Notification is not allowed for that extension.
- Before Idle Extension Notification is requested no indication is given to the attendant of the extension being first or second degree busy. The feature first/second degree busy indication (ABDA) does not give an indication for calls on the source side of the attendant.
- When an Idle Extension Notification request has recalled and is answered by the attendant, a destination DN cannot be dialed until there is an established call on the SRC side.
- No Camp-On/Periodic Camp-On tone is given to an extension that is supervised for Idle Extension Notification even if the customer's OPT is CTA and the extension's CLS is WTA.
- The feature Idle Extension Notification is implemented in MCDN (Meridian Customer Defined Networking) ISDN networks. Wherever ISDN network environments are mentioned, MCDN ISDN networks are considered. The feature is not supported on DPNSS networks or through MCDN to DPNSS Gateway nodes.

- The Idle Extension Notification feature is not valid for the 2616 set.
- If in an ISDN network environment there are nodes with the Idle Extension Notification feature active and nodes without the feature active, the feature will not work across the network. However it will work locally in the nodes where it is active. If an attempt to request for Idle Extension Notification on an extension situated in a node that does not have this feature active is made, no response from the node of the extension will be received and the SACP lamp stays dark. The attempt is canceled when the attendant presses the Release/Release SRC key. An error message (ERR5334) is printed in the node of the extension.

Feature interactions

The Idle Extension Notification feature is not supported on ACD DNs.

An Idle Extension Notification call cannot be placed on hold by the attendant. If the attendant attempts to place an Idle Extension Notification call on hold before the Release key is pressed, the Idle Extension Notification request is canceled and the call is disconnected. An answered Idle Extension Notification recall cannot be placed on hold until after the SACP key is pressed to ring the extension.

When an attendant has requested an Idle Extension Notification, it can be canceled by then pressing the Position Busy key. This will also cancel all other Idle Extension Notification requests.

Idle Extension Notification and pre-dial Break-In are mutually exclusive. It is possible to press the Break-In key, the DN of a busy extension (to override call forward, for example), and then press the SACP key to request Idle Extension Notification. While the SACP lamp is lit, it is not possible to press the Break-In key to complete the Break-In. Conversely, if a Break-In conference is underway, it is not possible to activate Idle Extension Notification by pressing the SACP key.

If the SACP lamp is lit during the pre-dial Break-In sequence, the only available possibilities are: to press the Release key to request for Idle Extension Notification; to press the SACP key again to remove the request; or to press the Release SRC key to Release the source without requesting Idle Extension Notification. If the Idle Extension Notification request is removed by pressing the SACP key a second time (or due to any other limitation of Idle Extension Notification), Break-In is then possible.

It is not possible to do a Post-Dial Break-In on the source side of the attendant, therefore it is not possible to request for Idle Extension Notification in conjunction with Post-Dial Break-In. This means that it is not possible to a Break-In after an Idle Extension Notification recall is answered if the wanted extension becomes busy again.

When an extension that is being supervised for an Idle Extension Notification to the attendant becomes idle, it is kept busy from receiving any incoming calls. The lamp on the attendant console for that DN will display a busy status, according to the parameters of the Busy Lamp Field/Enhanced Busy Lamp Field feature.

It is not possible to request for Idle Extension Notification if the Busy Verify feature has been activated after the Busy Verify key is pressed.

When an extension that is being supervised for Idle Extension Notification becomes idle, it has the ability to make outgoing calls. If Call Forward All Calls or Intercept Call Forward are activated at the extension before the attendant presses the SACP key to ring that extension, the attendant's call will be forwarded to the Call Forward destination. The attendant display will show both the call forward DN as well as the original extension's DN.

If the Call Forward DN is busy, SACP can be activated towards the Call Forward DN, if all the requirements for allowing Idle Extension Notification are met by this DN.

If an extension has Call Waiting configured, it is not possible to request Idle Extension Notification. Call Waiting has precedence over the Idle Extension Notification feature.

When an extension is blocked for receiving calls due to the Idle Extension Notification feature, camp-on is not possible.

It is not possible to request for Idle Extension Notification towards an extension that has the Do-Not-Disturb feature activated.

The Idle Extension Notification feature is not supported on DPNSS networks.

It is not possible to request for Idle Extension Notification towards an extension that is Second Degree Busy. Idle Extension Notification is only possible on an extension that is First Degree Busy.

It is not possible to set Idle Extension Notification towards a pilot DN.

If the attendant dials a busy extension that has Hunting configured and where all the DNs in the hunt chain are busy, Idle Extension Notification may be requested towards the dialed extension.

ISDN BRI extensions always have the Call Waiting feature equipped, therefore Idle Extension Notification is not possible.

The Idle Extension Notification feature is available for ISDN Meridian Customer Defined Networking (MCDN) networks using BRI TIE trunks if Network Attendant Service is configured.

It is not possible to request for Idle Extension Notification towards an extension that has the Make Set Busy feature activated.

If Idle Extension Notification is requested for a Multiple Call Arrangement DN, the first extension with this DN that becomes idle will cause the recall. This extension will also be blocked from receiving calls.

An Idle Extension Notification recall will always recall to the same attendant, regardless of the configuration of the Recall To Same Attendant (RTSA) feature.

During the time that an extension is supervised or temporarily blocked from receiving calls due to the Idle Extension Notification feature, it is possible to activate Ring Again towards that extension. It is also possible to request for Idle Extension Notification on an extension that is supervised for Ring Again. When the extension becomes idle, the Idle Extension Notification will be served first.

Feature packaging

The following packages are required for Idle Extension Notification:

- Attendant Break-in/Trunk Offer (BKI) package 127
- International Supplementary Features (SUPP) package 131
- Integrated Services Digital Network (ISDN) package 145
- Advanced ISDN Network Services (NTWK) package 148
- Network Attendant Service (NAS) package 159
- Semi-automatic Camp-on (SACP) package 181

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 12 – Designate the Semi-automatic Camp-on key.

2 LD 15 – Configure a new Incoming Call Indicator (ICI) key for customer data.

3 LD 16 – Configure the Idle Extension Notification block timer.

LD 12 – Designate the Semi-automatic Camp-on key.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	aaaa	Type of console, where aaaa = 1250 for M1250 console, 2250 for M2250 console, ATT for QCW3, QCW4 console, or PWR if the TN is used for power or Attendant Supervisory Module ASM.
TN	l s c u	Terminal Number.
	c u	For Option 11C.
...		
CUST	xx	Customer number.

...		
KEY	xx SACP	Key number, Semi-automatic Camp-on/Idle Extension Notification.

LD 15 – Configure a new Incoming Call Indicator (ICI) key for customer data.

Prompt	Response	Description
REQ:	NEW CHG	New, or change.
TYPE:	ATT	Attendant Console options.
CUST	xx	Customer number.
...		
ICI	xx IEN	ICI number, Idle Extension Notification.

LD 16 – Configure the Idle Extension Notification block timer.

Prompt	Response	Description
REQ	NEW CHG	New, or change.
TYPE	RDB	Route Data Block.
CUST	xx	Customer number.
...		
CNTL	YES	Changes to Controls or Timers.
- TIMR	IENB 2-(5)-10	Idle Extension Notification block timer, in minutes. The default value is five minutes. Both SACP and NAS packages must be equipped.

Feature operation

No specific operating procedures are required to use this feature.

Incoming Trunk Programmable Calling Line Identification

Contents

The following are the topics in this section:

Feature description 757
Operating parameters 758
Feature interactions 758
Feature packaging 759
Feature implementation 759
Task summary list 759
Feature operation 760

Feature description

The Incoming Trunk Programmable Calling Line Identification feature allows a billing number to be assigned to incoming trunk routes. The billing number length can be from one to 16 digits, and is only used when the incoming trunk terminates to a PRI trunk connected to a Public Exchange/Central Office. The billing number is inserted into the Calling Line Identification (CLID) field of the outgoing PRI/BRI trunk route.

An option is also provided that allows the billing number to have the “Presentation Allowed” field in the outgoing route CLID to be allowed or denied. This will allow or deny the display of the billing number when the call terminates on a set off the Central Office.

In addition, incoming routes that support CLID can have the Billing Number replace the CLID for tandeming only.

Operating parameters

This feature is not supported on the following outgoing interface types:

- SL-1 interfaces, and
- DPNSS1 interfaces.

M911 trunks do not support the billing number.

If the route defined is both incoming and outgoing, the billing number will only be used for incoming calls to support outgoing Integrated Services Digital Network (ISDN) routes.

The billing number is not unique; the same number can be programmed for multiple routes.

The billing number is only inserted on tandem calls for supporting trunks to the Central Office. Therefore, the display of billing number on sets is not provided, and the CDR output will not show the billing number.

There is no control over how the Central Office uses the billing number. The presentation indicator is configurable to either allow or deny the displaying of the billing number. This is only used for the outgoing call to the Central Office which means when the call terminates on a set off the Central Office the billing number will be displayed at that set if the option is set (BDSP = YES).

Call redirection is not supported (e.g., if the incoming call terminates on the Meridian 1 and is transferred, or call forwarded to the Central Office, the billing number is not passed on to the Central Office).

Feature interactions

R2MFC CNI/CDR Enhancements

Incoming Trunk Programmable CLID takes precedence over the R2MFC CNI/CDR Enhancements feature. If the outgoing ISDN trunk is allowed to send a billing number, the billing number is sent out as the CLID, not the CNI from the incoming trunk.

Feature packaging

The following package is required for Incoming Trunk Programmable Calling Line Identification:

- Integrated Services Digital Network (ISDN) package 145.

For ISDN and networking, the following packages are required:

- Basic Routing (BRTE) package 14;
- Network Class of Service (NCOS) package 32;
- Basic Alternate Route Selection (BARS) package 57 or Network Alternate Route Selection (NARS) package 58 or Coordinated Dialing Plan (CDP) package 59.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 16 – Configure the incoming route.

2 LD 16 – Configure the outgoing route.

LD 16 – Configure the incoming route.

Prompt	Response	Description
REQ	NEW CHG	New, or Change.
TYPE	RDB	Route data block.
...		
BILN	(NO) YES	Billing number (is not) is required.
BLEN	1-(10)-16	Billing number length. The default is 10 digits.
BNUM	x...x	Billing number (1 to 16 digits).
BDSP	(NO) YES	(Do not) display Billing Number.

LD 16 – Configure the outgoing route.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	RDB	Route data block.
...		
ISDN	YES	ISDN route must be YES.
...		
IFC	xxxx	Select the appropriate interface type for route (cannot be SL1 or IDA).
SBN	YES	(Do not) send billing number. Must be set to YES.

Feature operation

No specific operating procedures are required to use this feature.

Integrated Services Access

Contents

The following are the topics in this section:

Regional material statement 761
Feature description 761
Establishing ISA routes 762
Accessing the ISA master route 763
ISA capability 765
Enhancements 768
Operating parameters 768
Feature interactions 771
Feature packaging 772
Feature implementation 773
Task summary list 773
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Feature operation 777

Regional material statement

This feature is only available in North America. Contact your system supplier or your Nortel Networks representative to verify support of this product in your area.

Feature description

Integrated Services Access (ISA) is an ISDN PRI feature offered by Meridian 1 for connecting to switches such as DMS-100 and DMS-250.

ISA allows multiple service routes to share the same common pool of B-channels. Unlike dedicated routes, which require each service route to have its own trunks of the same trunk type, ISA trunks are shared among many service routes, and they can carry calls of different types. These call types can change on a per call basis. In addition to taking on different trunk types, the service routes can also be uniquely configured for other features, such as Dialed Number Identification Services (DNIS), Incoming Digit Conversion (IDC), or Auto-Terminate.

AT&T's Call-by-Call nodal service offering is similar to Nortel Network's DMS-250 ISA. Instead of multiple call/trunk types over a single ISDN PRI channel, AT&T offers services from the 4ESS Inter Exchange Carrier (IEC) such as MEGACOM, SDN, and ACCUNET.

Establishing ISA routes

Basic PRI configuration must be performed before Integrated Services Access (ISA) is defined (see "ISDN product overview"). ISA routes and trunks must be defined to access Nortel Network's ISA functionality or AT&T's Call-by-Call Service.

You cannot configure trunks for the service route that also accesses the ISA master route. With a single PRI (23B + D) configuration, all 23 B-channels can be configured for the ISA master route.

ISA routes cannot be accessed directly, so they must be blocked in the following programs, if applicable:

LD 19	Code Restriction
LD 27	Alternate Route Selection (ARS)
LD 86	Network Alternate Route Selection (NARS) and Basic Alternate Route Selection (BARS)
LD 93	Tenant Services

Accessing the ISA master route

The caller dials the access code of a service route to access an ISA master route. This access can also be achieved through digit manipulation by BARS or NARS or by means of direct trunk access (TARG) values in LD 10, LD 11, and LD 16. A route is configured as an ISA type through service change in LD 16. The ISA master route contains a list of B-channels over PRI that can be shared.

Different service route types such as TIE or WATS are created and associated with an ISA master route type. Service routes are not permitted to have Private trunks or B-channel members. To access call-by-call capability, the caller uses NARS/BARS or CDP. Automatic stepping from a service route to an ISA master route is performed and the ISA master route searches for an idle ISA channel. The caller is prevented from dialing the access code of an ISA master route directly.

These ISA configuration prompts are described in the following sections.

- the Network Service Facility (NSF) option
- the Min/Max function
- the Service Identifier (SID)

Network Services Facility option

This option is configured on the Meridian 1 to indicate whether it expects the Network Services Facility (NSF) Identification Element (IE) from the DMS. The NSF information dictates which service route the Meridian 1 will use to terminate an incoming call.

Nortel Networks connectivity to DMS provides Public, Private, INWATS, OUTWATS, TIE, and FX call types. When specifying COT or DID, the default is the Public call type. The call types determine the NSF values. (NSF = NO yields the Public call type.)

The values for the COT/DID service route (COTR), the WATS service route (WATR), and the TIE service route (TIER) are for incoming call termination only. Predefined NARS, BARS, or CDP allows multiple outgoing routes. The COTR can be a route number for a central office DID/DOD route. It is used for public calls. For incoming public calls, if COTR is a central office route, it is routed to the attendant. If it is a DID/DOD route, it translates the last "n" digits (as predefined in LD 15). For Private and TIE calls, the called number can be translated as defined for the service route.

With NSF = NO:

- COTR = all incoming DID/COT calls
- TIER = all incoming TIE calls

Only Public and TIE calls can be terminated. Because there is no Min/Max throttling, one service route may use all the trunks in the pool. If the NSF is sent from the central office, a master route can still be configured with NSF = NO and the NSF is ignored.

With NSF = YES:

- COTR = all incoming DID/COT calls
- WATR = incoming WATS calls without SID

Different TIE and FX calls can be terminated to multiple service routes. There can be multiple INWATS routes. These routes are distinguished by the unique SID defined in the service route. This number must be coordinated with the DMS for correct call termination.

Minimum and maximum counter function

The minimum and maximum counter (Min/Max) function allows customers more control and the ability to manage call patterns: you can define a minimum number of B-channels for a service route and you can define a maximum number of calls allowed per service route.

The sum of all the Min values must be less than or equal to the number of B-channels in the master route. The Max values for each service route must be equal to or less than the number of B-channels in the pool less all Min values from other service routes.

The sum of all Min values for the service route cannot exceed the number of B-channels defined for the ISA master route.

When the NSF prompt is YES and the Max value is reached in a service route, the All Trunks Busy (ATB) counter is incremented. The ATB count is not incremented when NSF is NO.

The ATB value is provided during the printing of traffic reports. The ATB is pegged against individual service routes when the maximum number of B-channels reserved for that call type has been reached. The ATB counter of an ISA master route is also incremented when the last B-channel of the ISA master route is busied. This occurs whether the NSF prompt is YES or NO.

Service Identifier

In addition to the call type (route type), each call is identified by a service Identifier (SID), which is used by the Meridian 1 and the central office for routing. The SID prompt is available when the NSF prompt is set to YES. These service identifiers must be set up in coordination with the central office for call type delivery and routing purposes.

The Service Identifier allows a call type with multiple SIDs such as INWATS to go to prespecified Directory Numbers.

Before this feature, the SID defaults to the route number, and the value range was 0–127. With the introduction of this feature, the SID no longer has a default value. Also, the value range of SIDs is expanded to support 0–511.

ISA capability

Basic ISA functionality includes the following:

- Incoming Digit Conversion (IDC) is supported for DID call type only.
- All INWATS calls terminate to the attendant console.
- ISA supports two-way DID trunk types (as do all PRI connections to a central office).
- A total of 127 SID routes is allowed for all trunk types per customer.
- Multiple routes can be defined.
- Calls are routed based on Service Identifier (SID) value.

Meridian 1 to DMS-100

WATS:

- Only one INWATS route can be defined.
- All INWATS calls terminate to the attendant console.
- OUTWATS services are not limited to a single outgoing route.

COT or DID:

- Only one incoming route can be defined: either COT or DID, but not both.
- DID trunk type supports two-way traffic (inbound and outbound).
- More than one outgoing route can be defined.
- DID operates like a two-way COT.

TIE:

- Multiple routes can be defined.
- They are routed according to the Service Identifier (SID) value.

Note: In LD 16, if NSF = NO, then only one TIE route can be defined.

FX:

- Multiple routes can be defined.
- They are routed according to the Service Identifier (SID) value.

Meridian 1 to DMS-250

This includes basic ISA functionality as well as the following:

- Private call type is supported for DMS-250 interfaces to the Meridian 1 and is defined as TIE.

WATS:

- Only one INWATS route can be defined.
- All INWATS calls terminate to the attendant console.
- OUTWATS services are not limited to a single outgoing route.

TIE:

- Multiple routes can be defined.
- They are routed according to the Service Identifier (SID) value.

Note: In LD 16, if NSF = NO, then only one TIE route can be defined.

FX:

- Multiple routes can be defined.
- They are routed according to the Service Identifier (SID) value.

COT or DID:

- Only one incoming route can be defined either COT or DID, but not both.
- DID trunk type supports two-way traffic (inbound and outbound).
- More than one outgoing route can be defined.
- DID operates like a two-way COT.

Meridian 1 to 4ESS

Meridian 1 supports the following AT&T 4ESS nodal service types:

- ACCUNET, a T1 access service for both voice or data
- SDN, Software Defined Network, an AT&T virtual networking package
- MEGACOM 800, inbound domestic bundling
- MEGACOM, outbound domestic bundling
- WATB, banded WATS (the user can specify a band, such as Band 3).
- WATM (the user can specify wide area service exclusive to Band 1 through 9; for example, Band 5 means 0 to 5).
- LDS, Long Distance Service, including “World Connect” (outbound international)
- IWAT, regular 800 service
- I800, International 800, anything outside the U.S.

Enhancements

ISA has ben enhanced to provide the following:

- Private, INWATS, FX, and TIE call types received from an ISA master route terminate to an individual set with or without Incoming Digit Conversion (IDC) for the DMS and AT&T interfaces.
- ISA service routes allow an Auto-Terminate DN to be defined in the route data block. Calls can terminate to an ACD queue using Dialed Number Identification Services (DNIS) for the DMS and AT&T interfaces.
- Private call type is supported for the DMS interface on a per route basis. (Specify Private in LD 16.)
- Service Identifier (SID) is supported with INWATS call types for the DMS interface.
- The Service Identifier (SID) value no longer defaults to route number. A unique value must be specified by the user.
- When printing the route data block for an ISA master route, all the associated service routes are printed after the new prompt, SVRT, in LD 21.

Operating parameters

The ISA enhancements are based on the following features:

- Dialed Number Identification Services (DNIS)
- Incoming Digit Conversion (IDC) for Direct Inward Dialing (DID)

Characteristics of the ISA enhancements are as follows:

- The range of the Service Identifier (SID) for the Meridian 1 to DMS interface is from 0 to 511. Each SID received in the ISA trunks uniquely corresponds to a service route defined in LD 16. Also, each service route uniquely corresponds to a SID in the DMS machine type.
- The range of the Service Parameter for the Meridian 1 to ESS interfaces is from 0 to 9 for the parameterized WATS band service. WATR and COTR depend on the operation of service routes.

- For Meridian 1 to DMS interfaces, if there is no Network Specific Facility Information Element (NSF) (IE) received in the ISA master route, Meridian 1 treats the call using the service route configuration defined for the COTR prompt in LD 16. If the trunk type of the COTR is COT, all the calls terminate to the Meridian 1 attendant. If the trunk type of the COTR is DID, each call terminates to its DID number. Similarly, if the trunk type of the WATR is WAT, all the calls terminate to the Meridian 1 attendant. If the trunk type of the WATR is DID, each call terminates to its DID number.
- For the Meridian 1 to ESS interfaces, if there is no NSF IE received in the ISA master route, Meridian 1 treats the call using the ISA service route configuration, which is defined as the ACCUNET service for the SRVC prompt in LD 16. If the trunk type of the ISA service route is Direct Inward Dialing (DID), each call terminates to its DID number.
- If an INWATS call or Public call received in the ISA master route is intended to be terminated to the Meridian 1 attendant, either IDC can be used to convert the incoming called number of the attendant DN, or the incoming called number must match the Listed Directory Number (LDN) in the Customer data block. You can also terminate one service route per ISA route by programming the service route number at the COTR and WATR prompts.
- For the Meridian 1 to DMS interfaces, the minimum and maximum counter (Min/Max) function is on a per service route basis. For example, route 40 (call type of OUTWATS with SID 9) or route 45 (call type of OUTWATS with SID 13) can each reserve its own minimum B-channels and limit its maximum B-channels to be used in the ISA pools.
- Since AT&T is limited to one service type per service route in a given ISA master route, for the Meridian 1 to ESS interfaces, the Min/Max counter function is on a per service route basis. That is, AT&T supports only one Min/Max function for the service types in a given ISA master route, not a Min/Max per band. Configure only one set of the minimum and the maximum B-channels in LD 16 for all the bands of the WATB service.
- For AT&T interfaces, only nine possible services can be used per ISA master route. With Nortel Networks DMS products, there are 512 possibilities, one for each SID value.

Tables 56 and 57 illustrate the Min/Max function, assuming 23 ISA B-channels.

Table 56
Example of Min/Max function for Meridian 1 to DMS

Call Type	Meridian 1 to DMS interface (WATR = 30, COTR = 10, NSF = YES)	MIN	MAX
Public	(rout 10, tkty DID, icog IAO)	10	13
Private	(rout 20, tkty TIE, sid 22, facy PRV, icog IAO)	1	3
INWATS	(rout 30, tkty WAT, icog ICT)	1	3
INWATS	(rout 35, tkty WAT, sid 30, icog ICT)	1	1
OUTWATS	(rout 40, tkty WAT, sid 9, icog OGT)	1	2
OUTWATS	(rout 45, tkty WAT, sid 13, icog IAO)	1	1
FX	(rout 60, tktp TIE, sid 60, facy TIE, icog IAO)	1	4
TIE	(rout 60, tkty TIE, sid 60, facy TIE, icog IAO)	2	3
TIE	(rout 65, tkty TIE, sid 65, facy TIE, icog IAO)	2	3
	Total	20	

Note 1: See the Min/Max rules contained in this module.

Note 2: Service types are dominant over call types with AT&T interfaces.

Table 57
Example of Min/Max function for Meridian 1 to ESS

Service	Meridian 1 to ESS interface	MIN	MAX
ACCunet	(rout 10, tkty DID, icog IAO)	10	15
SDN	(rout 20, tkty TIE, icog IAO)	1	3
IWAT	(rout 30, tkty WAT, icog ICT)	1	3
WATB	(rout 40, tkty WAT, sprm 9, icog OGT)	1	2
WATM	(rout 45, tkty WAT, icog OGT)	1	2
LDS	(rout 70, tkty TIE, icog IAO)	2	3
I800	(rout 80, tkty TIE, icog IAO)	2	3
	Total	18	
Note: See the Min/Max rules contained in this module.			

Feature interactions

- Enbloc dialing
  Enbloc dialing in ISDN PRI performs dialed digit analysis to determine the end of dialing before constructing the outgoing SETUP message. The Trunk Access Code applies to the service route, not to the ISA master route.
- nB+D Primary Rate Interface
  Meridian 1 allows 16 DS1 loops controlled by one primary D-channel (on channel 24 of the first DS1 loop) and one backup D-channel (on channel 24 of the second DS1 loop). ISA can use the 382 B-channels as the ISA pool of trunks.
- AT&T 4ESS SDN Access
  Software Defined Network (SDN) is a service offered by AT&T 4ESS for the virtual private network. SDN can be offered on dedicated channels or ISA channels.

- Incoming Digit Conversion (IDC)
  Part or all of the digits received in the DID route are converted and terminated at the existing internal DN in the Meridian 1. With this enhancement, IDC applies to the incoming WATS route over the ISDN interface.
- Dialed Number Identification Services (DNIS)
  DNIS provides the last three or four digits of the dialed DN from DID or TIE trunk to be displayed in the Meridian 1 set digit display when the DNIS call terminates on an ACD DN. DNIS length flexibility, allows 1–7 digits. DNIS is supported on a per route basis when using the ISA feature. DNIS also applies to the INWATS service route over the ISDN interface.

Feature packaging

The ISA feature requires the packages:

- NI-2 Call By Call (NI2 CBC) package 334
- Integrated Services Digital Network (ISDN) package 145
- Primary Rate Access (PRA) package 146, which requires as dependencies:
  - Digit Display (DDSP) package 19 (for CLID)
  - 1.5 Digital Trunk Interface (PBXI) package 75
  - Integrated Services Digital Network (ISDN) package 145
- NI-2 Cal By Call Service Selection (CBC) package 117, which requires as dependencies:
  - Integrated Services Digital Network (ISDN) package 145
  - Primary Rate Access (PRA) package 146
  - Inter Exchange Carrier (IEC) package 149

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 16 – Create an ISA master route.

2 LD 14 – Configure ISA trunks.

3 LD 16 – Configure ISA service routes.

Basic PRI configuration must be performed before Integrated Services Access (ISA) is defined. ISA routes and trunks must be defined to access Nortel Network's ISA functionality or AT&T's Call-by-Call Service.

LD 16 – Create an ISA master route.

Prompt	Response	Description
REQ	NEW CHG	Add or change data
TYPE	RDB	Route Data Block
CUST	xx	Customer number
ROUT	xx	Route number
TKTP	ISA	Create an ISA trunk route ***Note:*** Package 117, Call-By-Call Service, is required to define an ISA master route.
DTRK	YES	Digital trunk route
DGTP	PRI	Digital trunk type
ISDN	YES	ISDN option
MODE	PRA	D-channel mode controlling the route (ISA master route)
PNI	1–32700	Customer's Private ID
IFC	aaaa	Interface type: (D100), ESS4, ESS5, SL1, S100, D250 ***Note:*** The IFC of an ISA master route and its associated service route must match.

LD 16 – Create an ISA master route.

Prompt	Response	Description
NSF	(NO) YES	Network Service Facility (for TKTP = ISA and non-AT&T IFC; AT&T always has NSF)
COTR	xx	DID/central office route number Prompted if IFC = D100, SL1, S100, or D250. Enter CO or DID route.
TIER	xx	TIE route number Prompted if IFC = D100, SL1, S100, or D250 and NSF = NO
WATR	xx	WATS route number Prompted if IFC = D100, SL1, S100, or D250 and NSF = YES
ICOG	IAO ICT OGT	Incoming and outgoing trunk Incoming trunk Outgoing trunk
SRCH	RRB	Round robin hunting for outgoing trunks
ACOD	xxxx	Trunk route access code

LD 14 – Configure ISA trunks.

Prompt	Response	Description
REQ	NEW CHG	Add or change data
TYPE	ISA	ISA trunk type
TN	l s c u c u	Terminal number address. For option 11C. Use loop or card number created in LD 17
	xx	PRI loop or card number
	xx	PRI channel
CUST	xx	Customer number

LD 14 – Configure ISA trunks.

Prompt	Response	Description
RTMB	0-511 1-510 0-127 1-510	Route number and member number, for Options 51C-81C. Route number and member number, for Option 11C.
TGAR	(0)–31	Trunk Group Access Restriction
CLS	aaa	Class of service options

LD 16 – Configure ISA service routes.

Prompt	Response	Description
REQ	NEW	Add an ISA service route
TYPE	RDB	Route data block
CUST	xx	Customer number
ROUT	xx	Route number
TKTP	aaaa	Types of service route allowed with ISDN
DTRK	YES	Digital trunk route
DGTP	PRI	Digital trunk type
ISDN	YES	ISDN option
- MODE	PRA	PRA master route for ISA
IFC	aaaa	Interface type: (D100), ESS4, ESS5, SL1, S100, D250 ***Note:*** The IFC of an ISA master route and its associated service route must match.
SRVC	(ACC)	Service for AT&T ESS connections: NNSF, ACC, I800, LDS, M800, MEG, SDN, IWAT, WATM, WATB Prompted if IFC = ESS4 or ESS5 ***Note:*** NSF refers to the services provided on a Call-by-Call basis.
- SRPM	0–(9)	WATS band. Prompted only if SRVC = WATB.

LD 16 – Configure ISA service routes.

Prompt	Response	Description
ISAR	Yes, (No)	ISA service route
- RTN	xx	Select route number of any configured ISA master route Prompted only when ISAR = YES.
- FACY	YES (NO)	Facility for the call type (only applies if the far-end will be sending an NSF information element, NSF = YES) Prompted when TKTP = TIE, ISAR = YES, and IFC = D100/D250/S100 TIE connection in the NSF IE Private connection in the NSF IE
- SID	xx	Service Route Identifier number. Prompted if NSF = YES and TKTP = TIE/WAT/FX.
- MIN	xx	Minimum number of channels reserved on the ISA master route
- MAX	xx	Maximum number of channels reserved on the ISA master route
- PRIM	YES (NO)	ISA route class of service (not prompted after X11 R15
ICOG	IAO ICT OGT	Incoming and outgoing trunk Incoming trunk Outgoing trunk
ACOD	xxxx	Trunk route access code

Note: The Listed Directory Number (LDN0) value must be set in LD 15, Customer data block, in order to terminate ISDN/DID incoming calls such as ISA.

Feature testing

Test each PRI trunk to ensure that the Meridian 1 completes an ISA call. Run the following test for each of the available call types: TIE, FX, COT, INWATS, OUTWATS, and DID.

Note: COT and DID are recognized as Public call types and they must be on the same route. They can be used for incoming or outgoing routes.

To test ISA, follow steps 1 through 8.

1 Select a PRI to be tested.

2 Access LD 60. Use STAT command on all pertinent B-channels.

3 Set all the Min/Max values in all service routes to 1.

4 Make a test call on a trunk route that accesses the PRI being tested. Be sure the test call is to a valid destination.

5 Use LD 80 to ensure a B-channel from the ISA pool is in use. Then:

- Place the call on hold.
- Make another call. You should receive an overflow signal (fast busy).
- Repeat this procedure for every outgoing service route.

6 Disconnect both calls.

7 Ask the terminating end to place an incoming call for each incoming call type. Then:

- Place the call on hold.
- Ask the terminating end to place another call. They should receive an overflow signal (fast busy).

8 Disconnect both calls.

———————— ***End of Procedure*** ————————

Feature operation

No specific operating procedures are required to use this feature.

Integrated Trunk Access

Contents

The following are the topics in this section:

Regional material statement 779
Feature description 779
Operating parameters 780
Feature interactions 780
Feature packaging 780
Feature implementation 780
Feature operation 780

Regional material statement

This feature is only available in North America. Contact your system supplier or your Nortel Networks representative to verify support of this product in your area.

Feature description

Integrated Trunk Access (ITA) allows common digital transmission facilities (such as a T1 link) to be shared by:

- B-channel trunks (ISL/PRI)
- traditional A&B bit signaling trunks

This feature removes some trunks from PRI exclusive use, to share between PRI and traditional A&B signaling. ITA supports the following configurations:

- Meridian 1 to Meridian 1
- Meridian 1 to SL-100
- Meridian 1 to DMS-100
- Meridian 1 to DMS-250

Note 1: Channels must match for both signaling and routing.

Note 2: A separate Route Data Block (LD 16) must be configured for A/B channels. While PRI is operational, create an RDB for the A/B channels. Then remove the PRI trunks in LD 14. Create new trunks with the same TNs for the new route.

Operating parameters

There are no operating parameters associated with this feature.

Feature interactions

There are no feature interactions associated with this feature.

Feature packaging

This feature is included in base X11 System Software.

Feature implementation

There are no specific implementation procedures for this feature.

Feature operation

No specific operating procedures are required to use this feature

ISDN Calling Line Identification Enhancements

Contents

The following are the topics in this section:

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How CLID entries are assigned to a set 784
Examples of CLID generation 785
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Task summary list 806
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Feature description

The capabilities introduced by the ISDN Calling Line Identification (CLID) Enhancements greatly increases the functionality of CLID within any ISDN network.

These enhancements replace the previous method of constructing CLID, and allow much more flexibility when programming CLID for any telephone set on a Meridian 1. Prior to the enhancement, a CLID was defined as either a Listed Directory Number (LDN) or Primary Directory Number (PDN).

The contents of these data fields were used to generate the CLID for a call. The CLID could only be built from key 0 of a set. This meant that regardless of what key was used to make a call, it was the CLID for key 0 that was sent. Also, only one office code and one location code could have been assigned in the CLID for a customer.

CLID is now table-driven (when LD 15 is loaded, a customer can configure a CLID table), and virtually any of the information contained in the fields of the CLID table can now be programmed against any DN or DN key, on a per set basis. This means that the CLID that is sent from a set is now predicated on what is in the CLID table, rather than the LDN or PDN.

That is, a CLID for any key is now built by taking the information contained in a particular field in the CLID table and adding that information to the key's DN. A multi-line set can now have DN keys that each has its own CLID. Or, as explained in "How CLID entries are assigned to a set" on page 784, the CLID of any one key could, on a set, be programmed to use the CLID of any other key on the set.

Also, the Meridian 1 can now support multiple office codes, location codes and steering codes in CLID (this is more fully explained in the section "How a CLID table is built", which follows.) This means that any telephone set on one Meridian 1 can send a CLID that will have calls returned to another Meridian 1. This type of configuration would typically be used in cases where a customer would want calls to be returned to only one central location.

> ***Note:*** Since the system does not perform verification of CLID entries that are defined in a CLID table, it is the responsibility of the system administrator to ensure that DN keys are programmed correctly.

How a CLID table is built

New prompts have been added to LD 15 that create a CLID table for a customer. This table contains CLID 'entries' (up to 4,000.) Each entry contains unique information pertaining to CLID, as explained in the following sections.

North American Numbering Plan

For users of a North American Numbering Plan, the Meridian 1 can now support multiple Home Central Office Codes (HNXXs), Home Numbering Plan Area (HNPA) codes, Home Location Codes (HLOCs) and Local Steering Codes (LSCs), on a DN or DN key basis.

For a North American Numbering Plan, each CLID entry can contain the following:

- a one-six digit national code for a home national number (HNTN);
- a one-12 digit local code for a home local number (HLCL), or a one-12 digit Listed Directory Number for a switchboard;
- a one-seven digit Home Location Code (HLOC); and
- a one-seven digit Local Steering Code (LSC).

International Numbering Plan

For users of an International Numbering Plan, the Meridian 1 can now support multiple Prefix 1 (PFX1) and Prefix 2 (PFX2) contents, and multiple Home Location Codes (HLOCs) and Local Steering Codes (LSCs), on a DN or DN key basis.

For an International Numbering Plan, each CLID entry can now contain the following:

- a one-six digit national code for a home national number (HNTN), which is the equivalent of PFX1;
- a one-12 digit local code for a home local number (HLCL), which is the equivalent of PFX2, or a one-12 digit Listed Directory Number for a switchboard;
- a one-seven digit Home Location Code (HLOC);
- a one-seven digit Local Steering Code (LSC).

Another new capability, which applies to both the North American Numbering Plan and the International Numbering Plan, pertains to how the HLCL is constructed. A new prompt, DIDN (which signifies “use DN as a DID number”) in LD 15, allows the HLCL to be built either using the digits in the HLCL plus the digits of the active key (if DIDN is set to “YES” - the DN is considered to be a DID number and is included in the CLID), or only the digits in the HLCL (if DIDN is set to “NO” - the DN is not included in the CLID since it is not a DID number), or based on a search on the DN keys, beginning from key 0, to find the CLID to be used (DIDN is set to “SRCH”.) Please refer to Examples one to six in the “Examples of CLID generation” section starting on page 785.

How CLID entries are assigned to a set

Once the CLID table has been built for a customer, any CLID entry can be assigned to any set, on a per DN or DN key basis (any DN or DN key can be programmed against the information defined for any CLID entry in the CLID table.) This means that for a multi-line set, DN key 0 may send one CLID (the information contained in one CLID entry), DN key 1 may send a different CLID (the information contained in another CLID entry), and DN key 2 may send yet another CLID (the information contained in a third CLID entry). Therefore, a customer may now send different CLIDs from the same set.

Another enhancement pertains to Meridian 1 proprietary sets. When configuring the CLID for a DN key in LD 11, the value entered against the KEY prompt may be a CLID table entry number (0-3999), which corresponds to a CLID entry in the CLID table or ‘D’. If ‘D’ is entered, the Meridian 1 initiates a search on the set for a DN key, starting from key 0. The first found CLID is then sent as the CLID of the active DN key. This means that a call can be made on one key, and the CLID of another key is sent. This configuration is typically used in an ACD or Hotline DN key application, where, for example, the CLID for a particular key is not desired to be sent. Please refer to Examples seven, eight and nine in the “Examples of CLID generation” on page 785.

Prior to the CLID enhancement, for feature keys, such as the Call Transfer key (TRN), the Conference key (AO3 and AO6) and the No-hold Conference key (NHC), the DN of key 0 was used as the CLID DN when a call transfer or conference occurred over ISDN trunks. With the CLID enhancement, the CLID DN is now associated with the active DN key, rather than key 0.

Examples of CLID generation

The examples that follow show CLID generation using different combinations of CLID entries for DN keys, for Private ESN UDP/CDP calls and for Public Local and Public National calls.

Most of the examples use a North American Numbering Plan, since the construction of CLID entries in a CLID is the same for both a North American Numbering Plan and an International Numbering Plan. In some cases, however, examples are provided that pertain to calls using an International Numbering Plan.

Therefore, unless otherwise stated in the headings, the examples provided in the following sections pertain to calls made using a North American Numbering Plan.

The CLID construction for a CLID call type is as follows:

- Private ESN UDP Number - HLOC + DN
- Private ESN CDP Number - LSC + DN
- Public Local Number - HLCL + DN
- Public National Number - HNTN + HLCL + DN

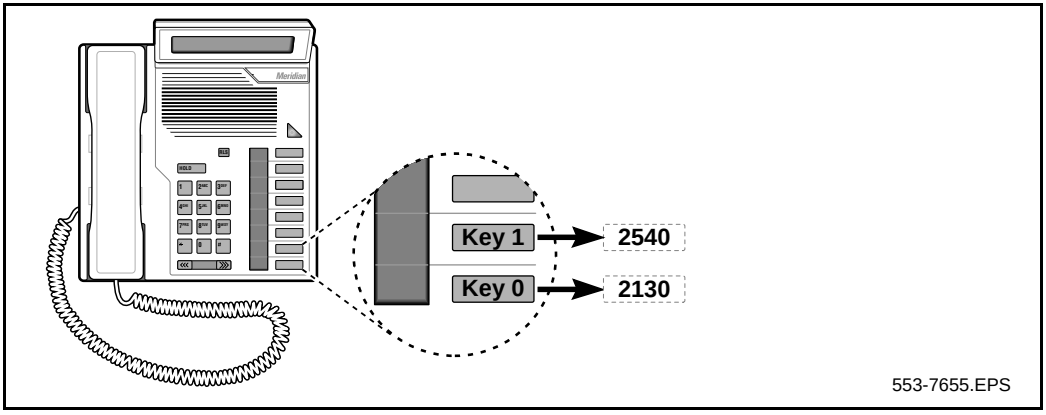
Please note that for calls made using the International Numbering Plan, the CLID for a Public Number is a National Number. For the examples of using the International Numbering Plan, the construction of a Public Local Number is for reference purposes only.

Example 1 - Set has DID number on DN key 0

In this example, the calls are made on DN key 0, which has a DID number. Key 0 is configured against CLID table entry 0, and key 1 is configured against CLID table entry 1.

Table 58
Set has DID number on DN key 0

CLID entry	HNTN (code for the home national number)	HLCL (code for the home local number), or LDN	DIDN (use the DN as the DID?)	HLOC (home location code)	LSC (local steering code)
Entry 0	415	940	YES	646	5
Entry 1	415	9699170	NO	646	5
Entry 2			SRCH	646	5



1 For a private ESN UDP call made from Key 0 (DN 2130) on the set, the CLID would be built as follows:

— HLOC from CLID entry 0 (646) plus the DN of the active key (2130).

— That is, the CLID that is sent would be 646 2130.

2 For a private ESN CDP call made from Key 0 (DN 2130) on the set, the CLID would be built as follows:

— LSC from CLID entry 0 (5) plus the DN of the active key (2130).

— That is, the CLID that is sent would be 5 2130.

3 For a public local call made from Key 0 (DN 2130) on the set, the CLID would be built as follows:

— HLCL from CLID entry 0 (940) plus the DN of the active key (2130).

— That is, the CLID that is sent would be 940 2130.

4 For a public national call made from Key 0 (DN 2130) on the set, the CLID would be built as follows:

— HNTN from CLID entry 0 (415) plus the HLCL from CLID entry 0 (940) plus the DN of the active key (2130).

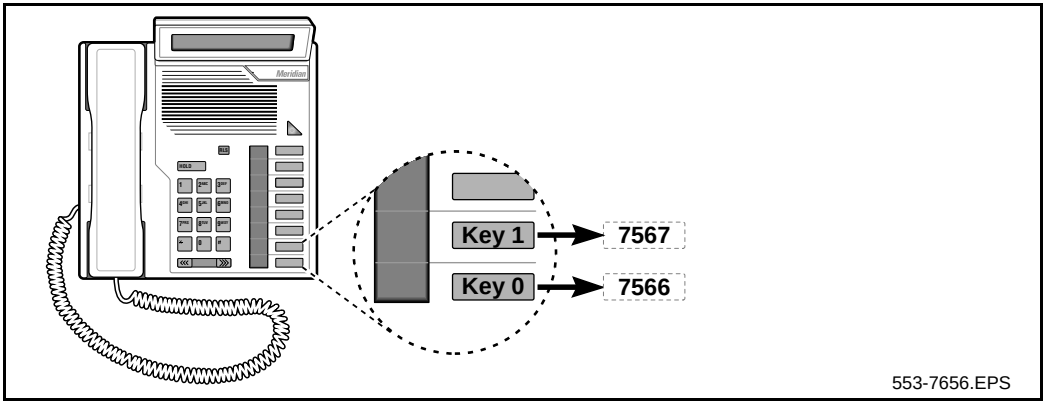
— That is, the CLID that is sent would be 415 940 2130.

Example 2 - Set has DID number on DN key 0, International Numbering Plan.

In this example, the calls are made on DN key 0, which has a DID number. Key 0 is configured against CLID table entry 0, and key 1 is configured against CLID table entry 1.

Table 59
Set has DID number on DN key 0, for an International Numbering Plan.

CLID entry	HNTN (code for the home national number, equivalent to PFX1)	HLCL (code for the home local number, equivalent to PFX2), or LDN	DIDN (use the DN as the DID?)	HLOC (home location code)	LSC (local steering code)
Entry 0	2	6476	YES	578	6
Entry 1	2	64767676	NO	578	6
Entry 2			SRCH	578	6



1 For a private ESN UDP call made from Key 0 (DN 7566) on the set, the CLID would be built as follows:

— HLOC from CLID entry 0 (578) plus the DN of the active key (7566).

— That is, the CLID that is sent would be 578 7566.

2 For a private ESN CDP call made from Key 0 (DN 7566) on the set, the CLID would be built as follows:

— LSC from CLID entry 0 (6) plus the DN of the active key (7566).

— That is, the CLID that is sent would be 6 7566.

3 For a public local call made from Key 0 (DN 7566) on the set, the CLID would be built as follows:

— HLCL from CLID entry 0 (6476) plus the DN of the active key (7566).

— That is, the CLID that is sent would be 6476 7566.

4 For a public national call made from Key 0 (DN 7566) on the set, the CLID would be built as follows:

— HNTN from CLID entry 0 (2) plus the HLCL from CLID entry 0 (6476) plus the DN of the active key (7566).

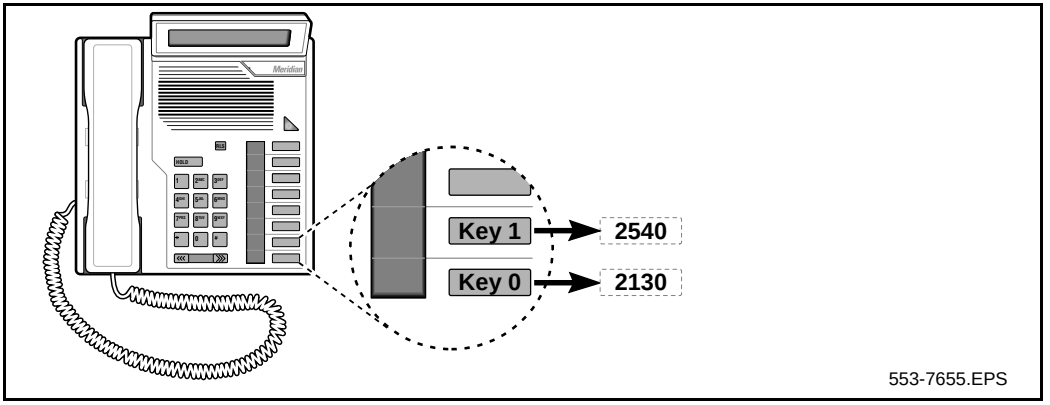
— That is, the CLID that is sent would be 2 6476 7566.

Example 3 - Set does not have a DID number on DN key 1 (DIDN set to NO)

In this example, the calls are made on DN key 1, which does not have a DID number. Key 0 is configured against CLID table entry 0, and key 1 is configured against CLID table entry 1, which has the DIDN option set to NO. This means that the CLID is built using only the digits defined in the HLCL field of table entry 1 (the DN of key 1 would not be sent in the CLID after the HLCL digits.)

Table 60
Set does not have a DID number on DN key 1 (DIDN set to NO).

CLID entry	HNTN (code for the home national number)	HLCL (code for the home local number), or LDN	DIDN (use the DN as the DID?)	HLOC (home location code)	LSC (local steering code)
Entry 0	415	940	YES	646	5
Entry 1	415	9699170	NO	646	5
Entry 2			SRCH	646	5



1 For a private ESN UDP call made from Key 1 (DN 2540) on the set, the CLID would be built as follows:

— HLOC from CLID entry 1 (646) plus the DN of the active key (2540).

— That is, the CLID that is sent would be 646 2540.

2 For a private ESN CDP call made from Key 1 (DN 2540) on the set, the CLID would be built as follows:

— LSC from CLID entry 1 (5) plus the DN of the active key (2540).

— That is, the CLID that is sent would be 5 2540.

3 For a public local call made from Key 1 (DN 2540) on the set, the CLID would be built as follows:

— HLCL from CLID entry 1 (9699170) - the DN of key 1 is not sent.

— That is, the CLID that is sent would be 9699170.

4 For a public national call made from Key 1 (DN 2540) on the set, the CLID would be built as follows:

— HNTN from CLID entry 1 (415) plus the HLCL from CLID entry 1 (9699170).

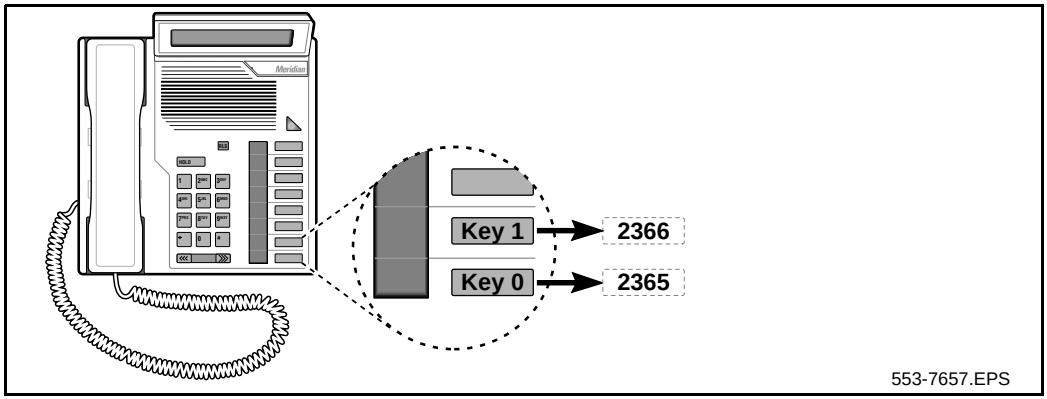
— That is, the CLID that is sent would be 415 9699170.

Example 4 - Set does not have a DID number on DN key 1 (DIDN set to NO), International Numbering Plan.

In this example, the calls are made on DN key 1, which does not have a DID number. Key 0 is configured against CLID table entry 0, and key 1 is configured against CLID table entry 1, which has the DIDN option set to NO. This means that the CLID is built using only the digits defined in the HLCL field of table entry 1 (the DN of key 1 would not be sent in the CLID after the HLCL digits.)

Table 61
Set does not have a DID number on DN key 1 (DIDN set to NO).

CLID entry	HNTN (code for the home national number)	HLCL (code for the home local number), or LDN	DIDN (use the DN as the DID?)	HLOC (home location code)	LSC (local steering code)
Entry 0	89	3505	YES	581	6
Entry 1	89	35052020	NO	581	6
Entry 2			SRCH	581	6



1. For a private ESN UDP call made from Key 1 (DN 2366) on the set, the CLID would be built as follows:
   - HLOC from CLID entry 1 (581) plus the DN of the active key (2366).
   - That is, the CLID that is sent would be 581 2366.
2. For a private ESN CDP call made from Key 1 (DN 2366) on the set, the CLID would be built as follows:
   - LSC from CLID entry 1 (6) plus the DN of the active key (2366).
   - That is, the CLID that is sent would be 6 2366.
3. For a public local call made from Key 1 (DN 2366) on the set, the CLID would be built as follows:
   - HLCL from CLID entry 1 (35052020) - the DN of key 1 is not sent.
   - That is, the CLID that is sent would be 35052020.
4. For a public national call made from Key 1 (DN 2366) on the set, the CLID would be built as follows:
   - HNTN from CLID entry 1 (89) plus the HLCL from CLID entry 1 (35052020).
   - That is, the CLID that is sent would be 89 35052020.

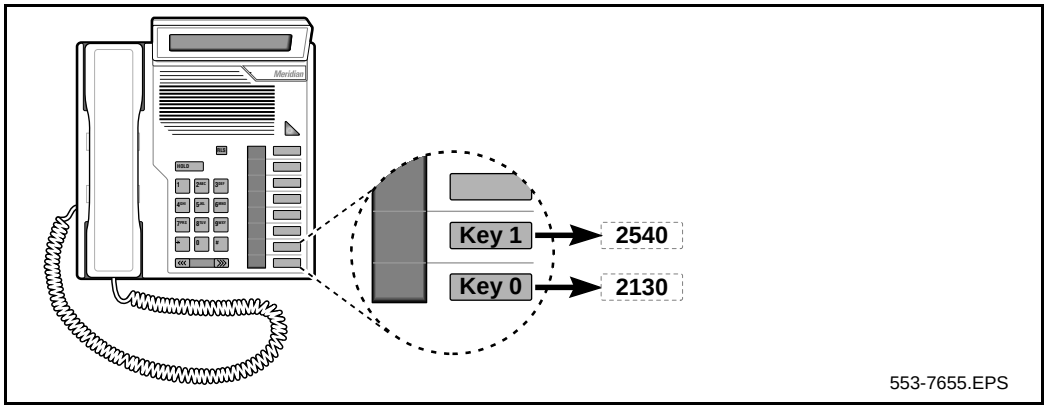
Example 5 - Set does not have DID number on DN key 1, SRCH option is used (DIDN is set to SRCH)

In this example, the calls are made on DN key 1, which does not have a DID number. Key 0 is configured against CLID table entry 0, and key 1 is configured against CLID table entry 2, which has the DIDN option set to SRCH.

This means that the CLID assigned for key 1 is constructed based on a search starting from key 0. When a CLID entry is found, which has DIDN set to YES (that would be key 0), the HLCL for that key is used in the CLID for key 1. Therefore, the CLID that is sent for key 1 would contain the HLCL of key 0 plus the DN of key 0.

Table 62
Set does not have a DID number on DN key 1, SRCH is used (DIDN is set to SRCH).

CLID entry	HNTN (code for the home national number)	HLCL (code for the home local number), or LDN	DIDN (use the DN as the DID?)	HLOC (home location code)	LSC (local steering code)
Entry 0	415	940	YES	655	6
Entry 1	415	9699170	NO	655	6
Entry 2			SRCH	655	6



1 For a private ESN UDP call made from Key 1 (DN 2540) on the set, the CLID would be built as follows:

— HLOC from CLID entry 2 (655) plus the DN of the active key (2540).

— That is, the CLID that is sent would be 655 2540.

2 For a private ESN CDP call made from Key 1 (DN 2540) on the set, the CLID would be built as follows:

— LSC from CLID entry 2 (6) plus the DN of the active key (2540).

— That is, the CLID that is sent would be 6 2540.

3 For a public local call made from Key 1 (DN 2540) on the set, the CLID would be built as follows:

— HLCL of CLID entry with DIDN set to YES (the HLCL of key 0, which is 940) plus the DN key 0 (2130.)

— That is, the CLID that is sent would be 940 2130.

4 For a public national call made from Key 1 (DN 2540) on the set, the CLID would be built as follows:

— HNTN from CLID entry 0 (415) plus the HLCL from CLID entry 0 (940) plus the DN of key 0.

— That is, the CLID that is sent would be 415 940 2130.

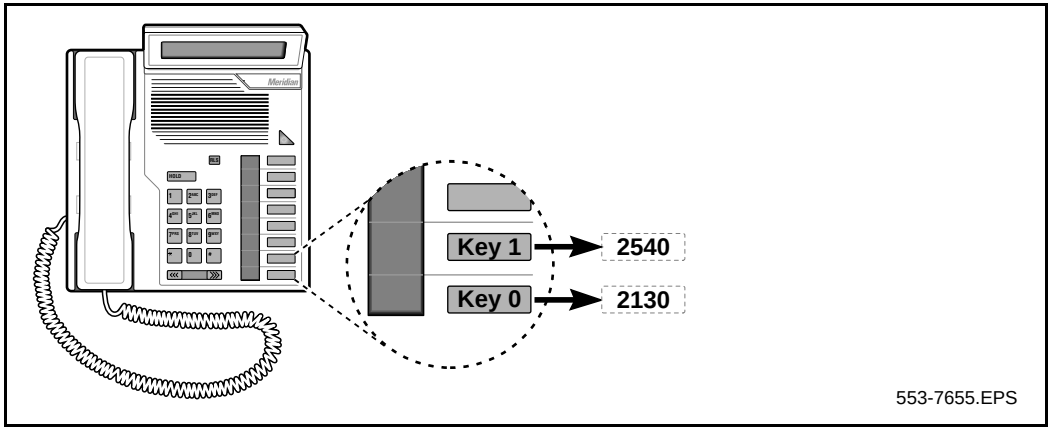
Example 6 -Set does not have DID number on DN key 1, SRCH option is used but does not find a DID

In this example, the calls are made on DN key 1, which does not have a DID number. Key 0 is configured against CLID table entry 1, and key 1 is configured against CLID table entry 2, which has the DIDN option set to SRCH. This means that the CLID assigned for key 1 is constructed based on a search starting from key 0.

Key 0 is configured against table entry 1. Since table entry 1 has DIDN set to NO, the search next takes place on key 1, which is configured against table entry 2. Since table entry 2 does not have DIDN set to YES either, the search fails to find a CLID entry which has DIDN set to YES. This means that the CLID for key 1 is constructed using only the HLCL of the active DN (that is, the HLCL for key 1, which is the HLCL defined in table entry 2.)

Table 63
Set does not have a DID number on DN key 1, SRCH option fails to find a DID.

CLID entry	HNTN (code for the home national number)	HLCL (code for the home local number), or LDN	DIDN (use the DN as the DID?)	HLOC (home location code)	LSC (local steering code)
Entry 0	415	940	YES	646	5
Entry 1	415	9699170	NO	646	5
Entry 2	408	9885560	SRCH	655	6



1 For a private ESN UDP call made from Key 1 (DN 2540) on the set, the CLID would be built as follows:

— HLOC from CLID entry 2 (655) plus the DN of the active key (key 1, 2540).

— That is, the CLID that is sent would be 655 2540.

2 For a private ESN CDP call made from Key 1 (DN 2540) on the set, the CLID would be built as follows:

— LSC from CLID entry 2 (6) plus the DN of the active key (2540).

— That is, the CLID that is sent would be 6 2540.

3 For a public local call made from Key 1 (DN 2540) on the set, the CLID would be built as follows:

— HLCL of CLID entry 2 (9885560) - since the search failed to find a DID number, only the HLCL of the active key (key 1, which is configured against table entry 2) is sent in the CLID. Since the DN of Key 1 (2540) is not a DID number, it is not sent in the CLID.

— That is, the CLID that is sent would be 9885560.

4 For a public national call made from Key 1 (DN 2540) on the set, the CLID would be built as follows:

— HNTN from CLID entry 2 (408) plus the HLCL from CLID entry 2 (9885560) - since the DN of Key 1 is not a DID number, the DN (2540) is not sent..

— That is, the CLID that is sent would be 408 9885560.

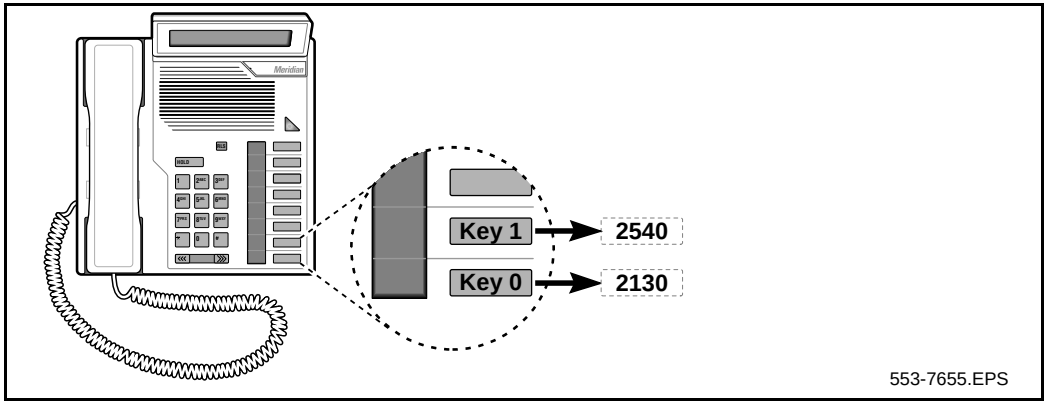
Example 7 - Set with DN KEY prompt of “D” on key 1

In this example, the calls are made on DN key 1, which has the KEY prompt set to “D” in LD 11. This means that a search is done on the set for a DN key, starting from key 0. The CLID of the found DN (key 0 in this case) key is used as the CLID of the active DN key; that is, the CLID for key 0 is used as the CLID for key 1.

Key 0 is configured against CLID table entry 0, and key 1 uses the CLID assigned to key 0.

Table 64
Set with DN KEY prompt of "D" on key 1.

CLID entry	HNTN (code for the home national number)	HLCL (code for the home local number), or LDN	DIDN (use the DN as the DID?)	HLOC (home location code)	LSC (local steering code)
Entry 0	415	940	YES	646	5
Entry 1	415	9699170	NO	646	5
Entry 2			SRCH	646	6



1. For a private ESN UDP call made from Key 1 (DN 2540) on the set, the CLID would be built as follows:
   - HLOC from CLID entry 0 (646) plus the DN for key 0 (2130) - since the Key option has been set to 'D', a search is done from key 0 to find a DN key. The CLID for the found DN key is used as the CLID of active DN key - therefore, CLID for key 0 (the found DN) is used in the CLID for key 1. This also applies to cases 2, 3 and 4 which follow.
   - Therefore, the CLID that is sent would be 646 2130.
2. For a private ESN CDP call made from Key 1 (DN 2540) on the set, the CLID would be built as follows:
   - LSC from CLID entry 0 (5) plus the DN of key 0 (2130).
   - That is, the CLID that is sent would be 5 2130.
3. For a public local call made from Key 1 (DN 2540) on the set, the CLID would be built as follows:
   - HLCL of CLID entry 0 (940) plus the DN of key 0 (2130).
   - That is, the CLID that is sent would be 940 2130.
4. For a public national call made from Key 1 (DN 2540) on the set, the CLID would be built as follows:
   - HNTN from CLID entry 0 (415) plus the HLCL from CLID entry 0 (940) plus the DN of key 0 (2130).
   - That is, the CLID that is sent would be 415 940 2130.

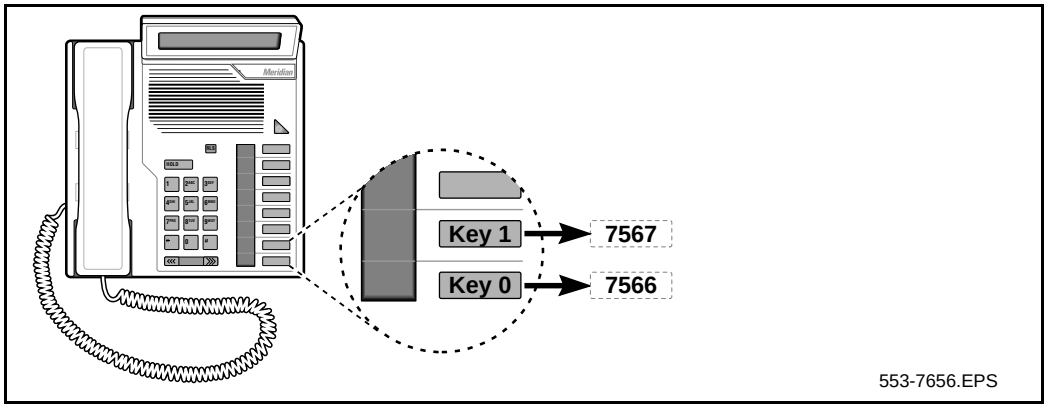
Example 8 - Set with DN KEY prompt of "D" on key 1, International Numbering Plan

In this example, the calls are made on DN key 1, which has the KEY prompt set to "D" in LD 11. This means that a search is done on the set for a DN key, starting from key 0. The CLID of the found DN (key 0 in this case) key is used as the CLID of the active DN key, that is, the CLID for key 0 is used as the CLID for key 1.

Key 0 is configured against CLID table entry 0, and key 1 uses the CLID assigned to key 0.

Table 65
Set with DN KEY prompt of "D" on key 1.

CLID entry	HNTN (code for the home national number)	HLCL (code for the home local number), or LDN	DIDN (use the DN as the DID?)	HLOC (home location code)	LSC (local steering code)
Entry 0	2	6476	YES	578	6
Entry 1	2	64767676	NO	578	6
Entry 2			SRCH	578	6



1 For a private ESN UDP call made from Key 1 (DN 7567) on the set, the CLID would be built as follows:

— HLOC from CLID entry 0 (578) plus the DN for key 0 (7566) - since the Key option has been set to 'D', a search is done from key 0 to find a DN key. The CLID for the found DN key is used as the CLID of active DN key - therefore, CLID for key 0 (the found DN) is used in the CLID for key 1. This also applies to cases 2, 3, and 4 which follow.

— Therefore, the CLID that is sent would be 578 7566.

2 For a private ESN CDP call made from Key 1 (DN 7567) on the set, the CLID would be built as follows:

— LSC from CLID entry 0 (6) plus the DN of key 0 (7566).

— That is, the CLID that is sent would be 5 2130.

3 For a public local call made from Key 1 (DN 7567) on the set, the CLID would be built as follows:

— HLCL of CLID entry 0 (6476) plus the DN of key 0 (7566).

— That is, the CLID that is sent would be 6476 7566.

4 For a public national call made from Key 1 (DN 7567) on the set, the CLID would be built as follows:

— HNTN from CLID entry 0 (2) plus the HLCL from CLID entry 0 (6476) plus the DN of key 0 (7566).

— That is, the CLID that is sent would be 2 6476 7566.

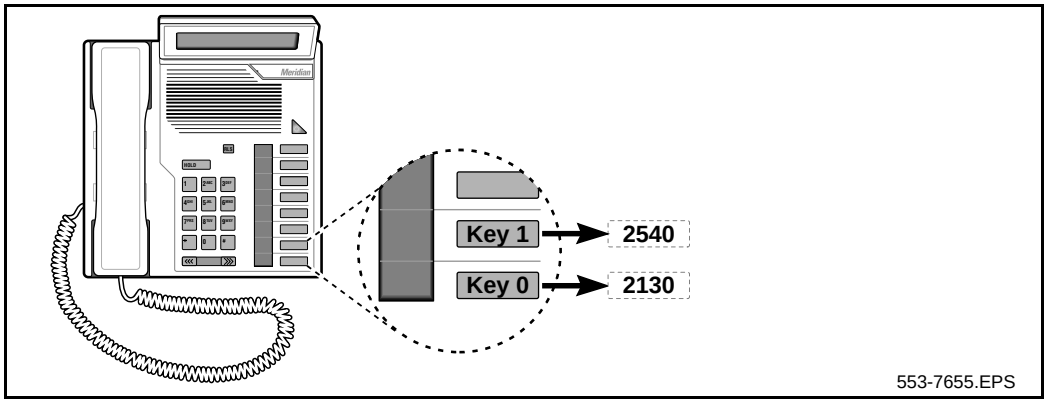
Example 9 - Set with DN KEY prompt of “D” on key 0

In this example, the calls are made on DN key 0, which has the KEY prompt set to “D” in LD 11. This means that a search is done on the set for a DN key, starting from key 0. The CLID of the found DN key (key 1 in this case) is then used as the CLID of the active DN key, that is, the CLID assigned to key 1 is used as the CLID for key 0.

Key 1 is configured against CLID table entry 0, and key 0 uses the CLID assigned to key 1.

Table 66
Set with DN KEY prompt of “D” on key 0.

CLID entry	HNTN (code for the home national number)	HLCL (code for the home local number), or LDN	DIDN (use the DN as the DID?)	HLOC (home location code)	LSC (local steering code)
Entry 0	415	940	YES	646	5
Entry 1	415	9699170	NO	646	5
Entry 2			SRCH	655	6



1 For a private ESN UDP call made from Key 0 (DN 2130) on the set, the CLID would be built as follows:

— HLOC from CLID entry 0 (646) plus the DN for key 1 (2540) - since the Key option has been set to ‘D’, a search is done from key 0 to find a DN key. The CLID for the found DN key is used as the CLID of active DN key - therefore, CLID for key 1 (the found DN) is used in the CLID for key 0. This also applies to cases 2, 3, and 4 which follow.

— Therefore, the CLID that is sent would be 646 2540.

2 For a private ESN CDP call made from Key 0 (DN 2130) on the set, the CLID would be built as follows:

— LSC from CLID entry 0 (5) plus the DN of key 1 (2540).

— That is, the CLID that is sent would be 5 2540.

3 For a public local call made from Key 0 (DN 2130) on the set, the CLID would be built as follows:

— HLCL of CLID entry 0 (940) plus the DN of key 1 (2540).

— That is, the CLID that is sent would be 940 2540.

4 For a public national call made from Key 0 (DN 2130) on the set, the CLID would be built as follows:

— HNTN from CLID entry 0 (415) plus the HLCL from CLID entry 0 (940) plus the DN of key 1 (2540).

— That is, the CLID that is sent would be 415 940 2540.

Operating parameters

In order for CLID to be properly delivered, a CLID entry must be defined in the CLID table for a customer. If a CLID entry or table is not defined, the active DN is sent as CLID.

The ISDN Calling Line Identification (CLID) Enhancements feature only pertains to calls that are made over ISDN routes.

The CLID that is sent from the Meridian 1 may be subject to any restrictions which may be imposed by the serving Telco.

This feature does not change the operation of CLID for attendant consoles. The codes for different call types are extracted from CLID entry 0 in LD 15, the customer data block. If the call type is private, the attendant DN is used. If the call type is public, LDN0 is used.

There is no system validation of digits entered in the CLID entry via a service change. Therefore, caution must be taken that any digits that are entered are valid and correct.

There is no cross-validation of the CLID entry associated with a set against the CLID entry entered in LD 15. If a CLID entry is deleted from the CLID table and the CLID entry remains assigned to a DN key, the active DN is sent as CLID.

The maximum number of digits for a CLID in an ISDN message is 16.

The restriction remains of constructing a seven-digit local number or a 10-digit national number, for the North American Numbering Plan. Also, a seven-digit maximum is maintained for an ESN Uniform Dialing Plan number, if the Flexible Numbering Plan package is not equipped. The seven and 10 digit restriction for a public number does not apply to International ISDN interfaces.

The CLID is constructed using the information in the CLID table associated with the active DN key for the calling party in the Setup message and the connected party in the Connected and Notify messages. This feature does not change the Information Elements pertaining to any other ISDN network DNs, such as for Redirecting and Original Called Number.

For ISDN supplementary services, the ISDN CLID enhancements do not change how a Network DN is constructed. For a Local Number, the Network DN is formed using the Home Central Office Code (HNXX)/Prefix 2 (PFX2). For ESN Numbers, the Network DN is formed using the Home Location Code (HLOC) for a Uniform Dialing Plan number or the Local Steering Code (LSC) for a Coordinated Dialing Plan number.

Feature interactions

Attendant Administration

Administration of a CLID entry, for a set from an attendant console, is not supported.

Automatic Call Distribution

The ACD DN is sent as the CLID for a call made by an ACD agent using a DN key on a key other than Key 0. With the feature enhancement, the CLID is constructed using the CLID entry associated with the active DN key. The ACD agent ID is not designed to be sent as the CLID.

If an ACD agent has an active call on Key 0 and if a call transfer or conference is initiated by the ACD agent, the CLID entry associated with the ACD DN Key 0 is used as the CLID (for remote calls only.)

There is no CLID entry for an analog (500/2500 type) ACD DN. The CLID associated with the analog (500/2500 type) DN is used when a call transfer or conference is initiated by an ACD agent on an analog (500/2500 type) set.

Call Detail Recording

The CLID in the CDR records, including the X records, contains the DN of the key from which the call is made, not the DN of Key 0.

Call Pickup Network Wide

The Private Integrated Services Network Exchange (PINX) DN in the customer data block is used for Call Pickup Network Wide. The network DN for the PINX DN is constructed using the existing Home Location Code (HLOC) or Local Steering Code (LSC) in LD 15. The DN of the originating party is constructed using the CLID associated with the active DN key. The DN of the originally called (ringing) party is constructed using the existing HLOC or LSC in LD 15.

For calls picked up from a secondary DN, the redirection DN in the Notify message is formatted with the CLID entry 0 of LD 15.

Calling Party Name Display

If a call transfer or conference is initiated on a multiple appearance DN programmed on a key other than Key 0, the Call Party Name Display associated with the DN of the active key is used, rather than the Call Party Name Display for Key 0.

CLID for an ISDN BRI set

For an internal call terminating on an ISDN BRI set, the calling set's Dialed Digits Denied (DDGD)/Dialed Digits Allowed (DDGA) Class of Service is used to determine whether to send Calling Party Number to the terminating ISDN BRI set for display purposes.

Connected Number

When a call is modified, such as by a call transfer, this feature enhancement will try to use the CLID entry associated with the active DN key if available, otherwise the connected number will be constructed using CLID entry 0.

EuroISDN Continuation for UK/Spain/Belgium/SN3

The EuroISDN Continuation feature allows Home National Numbers and Home Local Numbers to be configured on a route. When an ISDN call is made from a set to a EuroISDN interface, the CLID constructed by EuroISDN, based on the outgoing route, takes precedence over the CLID constructed for the calling station set.

EuroISDN Trunk - Network Side

The EuroISDN Trunk - Network Side connectivity supports all of the user side ISDN CLID enhancements.

Network Attendant Service

If Network Attendant Service is equipped, CLID entry 0 is used for incoming trunks.

Network Call Redirection

Network Call Redirection constructs Redirecting Number and Redirection Number. The feature enhancement does not change the construction of the Redirecting Number. However, the Redirection Number of the Notify message is constructed using the CLID entry 0 of LD 15.

Network Message Services
Message Waiting Indication with DMS

When a user leaves a voice message, from a multiple appearance DN, on a key other than Key 0 (such as Key 1), the caller's recorded number will be the multiple appearance DN on Key 1, rather than the primary DN of Key 0. This means that when the user returns the call, he/she will ring the DN of Key 1 on all the sets that have the appearance of the DN.

When a user retrieves messages using a multiple appearance DN key other than Key 0, the user now retrieves the messages on the other DN key.

The mail box number for a Network Message Service user is based on the original called number, in the form of a Coordinated Dialing Plan (CDP) or Uniform Dialing Plan (UDP) number. The construction of the original called number is not changed. If a user's DN is using a different Home Location Code or Local Steering Code for CLID, the Meridian Mail database adds the user's CLID as the mail box number. For example, if the first called number for a user is 6462300, a UDP number, and the user's CLID is 6472300, using CLID entry 'x', the user's mail box numbers are 6462300 and 6472300.

In general, with the enhancement of sending the DN associated with an active key to make a call to Meridian Mail, the secondary key's DN is included in the Meridian Mail User's definition (for either a local or remote user.)

Network Ring Again

The Network Ring Again feature remains operational when a user uses a multiple appearance DN on a key other than Key 0 to activate Network Ring Again, since Network Ring Again saves the Terminal Number of the set that initiates Network Ring Again.

Remote Virtual Queuing

The Remote Virtual Queuing (RVQ) feature remains operational when a user uses a multiple appearance DN on a key other than Key 0 to activate RVQ.

Transaction Capabilities Application Part (TCAP)

The network DN for TCAP messages is constructed using the existing Home Location Code (HLOC), Local Steering Code (LSC) or Home Numbering Plan Area (HNPA)/Home Central Office Code (HNXX) prompts in LD 15. The feature enhancement does not change the construction of the TCAP messages.

Feature packaging

The ISDN Calling Line Identification (CLID) Enhancements feature does not introduce any new package. However, Integrated Services Digital Network (ISDN) package 145 is required as a dependency.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 15 – Construct the CLID entry for a customer.

2 LD 21 – Print the CLID table for a customer.

3 LD 10 – Define the CLID entry for analog (500/2500 type) sets.

4 LD 11 – Define the CLID entry for DN keys for Meridian 1 proprietary sets.

5 LD 27 – Define the CLID entry for ISDN BRI sets.

LD 15 – Construct the CLID entry for a customer.

Prompt	Response	Description
REQ:	NEW CHG	Add new data, or change or delete existing data.
TYPE:	NET	Networking data (if REQ = CHG only.)
CUST	xx	Customer number.
...		
ISDN	YES	Integrated Services Digital Network.
- PNI	1-327000	Private Network Identifier.
- CLID	(NO) YES	CLID option. YES = configure a CLID table for the customer. NO = (the default) do not configure a CLID table. In this case, the remaining prompts are not generated, and no CLID is sent for the customer.
- - SIZE	0-(256)-4000	The maximum number of CLID entries needed for a customer. If REQ = NEW, you may select the default value (256) by entering <CR> in response to this prompt. It is advised that you not define a size much larger than actually needed. This entry may be increased or decreased as required.
- - INTL	0-9999 X	Country code, for international number. Enter X to delete digits.

- - ENTRY	aaaa Xaaaa Xaaaa Xbbbb <CR>	aaaa = CLID entry to be configured. Xaaaa = CLID entry to be deleted. Xaaaa Xbbbb = CLID entries to be deleted. aaaa and bbbb must be a value between 0 and (SIZE-1). The ENTRY prompt is repeated until <CR> is entered as a response. If REQ = NEW, only one new entry may be created. The entry will be saved to system memory when the configuration for the entire overlay is completed. If REQ = CHG, as many entries as needed may be created, changed or deleted. The action for the entry will be saved to system memory after the CLID entry has been completely configured, that is, after the LSC prompt has been answered. If a new CLID entry is created, or an existing CLID entry is changed, the message “ENTRY aaaa SAVED” is displayed after the LSC prompt. If a CLID entry or CLID entries is/are deleted, the message “ENTRY aaaa DELETED” or “ENTRIES aaaa-bbbb DELETED” is displayed after the LSC prompt.
- - - HNTN	0-999999 X	National code for home national number (1-6 digits). X = delete digits.
- - - HLCL	0-999..9 X	Local code for home local number or Listed Directory Number (1-12 digits). X = delete digits.
- - - DIDN		How to use the DN as a DID when constructing a CLID national or local number.
	(YES) NO SRCH	YES = The default. The CLID is constructed using the digits defined in HLCL followed by the DN of the active key. NO = Construct the CLID using the digits defined in HLCL. SRCH = Search on the set, from key 0 - upwards, to find a CLID entry which has the DIDN set to YES. Use the found CLID to construct the local number.
- - - HLOC	0-9999999 X	Home location code (ESN), 1-7 digits. X = delete digits.
- - - LSC	0-9999999 X	Local steering code, 1-7 digits. X = delete digits.
ENTRY aaaa SAVED ENTRY aaaa DELETED ENTRIES aaaa-bbbb DELETED		Displayed message. Refer to Note 3 for the ENTRY prompt.

It is advised that after the CLID table has been built in LD 15, a printout be generated, using LD 21, to verify the table entries defined in LD 15.

LD 21 – Print the CLID table for a customer.

Prompt	Response	Description
REQ:	PRT	Print the customer data block.
TYPE:	CLID	CLID entry data.
CUST	xx	Customer number.
SIZE	0-4000	The value that was defined for SIZE in LD 15 is printed automatically after the customer number has been entered.
RNGE	aaaa aaaa bbbb <CR>	CLID entry to be printed. Range of CLID entries to be printed (from aaaaa to bbbbb), aaaa and bbbb must be between 0 and the value defined for SIZE-1 in LD 15. Printing begins when <CR> is entered.
INTL	0-9999	Country code, for international number, is printed.
ENTRY	aaaa	CLID entry number in CLID table is printed. If a range of entries is entered in the RNGE prompt, all of the entries in the specified range are printed in sequence.
- HNTN	0-999999	National code for home national number, 1-6 digits, is printed.
- HLCL	0-999..9	Local code for home local number or Listed Directory Number, 1-12 digits, is printed.
- DIDN	YES NO SRCH	The desired choice of how to use the DN as a DID, when constructing a CLID national or local number, will be printed.
- HLOC	0-9999999	Home location code (ESN), 1-7 digits, is printed
- LSC	0-9999999	Local steering code, 1-7 digits, is printed.
...		

LD 10 – Define the CLID entry for analog (500/2500 type) sets.

Prompt	Response	Description
REQ:	NEW CHG	Add new data, or change existing data.
TYPE:	500	500 set.
TN	l s c u	Terminal Number.
	c u	For Option 11C.
...		
DIG	xx yy	Dial Intercom group number and member number.
DN	xxxx (0)-N	DN and CLID entry. N = CLID SIZE-1 (SIZE defined in LD 15).
...		

LD 11 – Define the CLID entry for DN keys for Meridian 1 proprietary sets.

Note: When assigning a CLID entry to an ACD set, you cannot use the same position ID already on the set. The set must be first outted, or the ACD key must be nulled and then rebuilt with the table entry number.

Prompt	Response	Description
REQ:	NEW CHG	Add new data, or change existing data.
TYPE:	xxxx	Type of telephone set.
TN	l s c u	Terminal Number.
	c u	For Option 11C.
...		

KEY	xx MCN yyyy (0)-N/D xx MCR yyyy (0)-N/D xx PVN yyyy (0)-N/D xx PVR yyyy (0)-N/D xx SCN yyyy (0)-N/D xx SCR yyyy (0)-N/D	Telephone function key assignments. xx = key number. MCN = Multiple Call Non-ringing key. MCR = Multiple Call Ringing key. PVN = Private Line Non-Ringing key PVR = Private Line Ringing key SCN = Single Call Non-ringing key. SCR = Single Call Ringing key. yyyy = DN. (0)-N = CLID entry, with N = CLID SIZE-1 (SIZE defined in LD 15). D = CLID entry. Search for a CLID entry from key 0 upwards, to find a DN key. The found CLID is used as the CLID entry for the active DN key.
KEY	xx HOT D dd yyy...y zzzz m (0)-N/D	Two-way Hotline Direct key, where: xx = key number. dd = number of digits dialed. yyy...y = target number (terminating DN, maximum of 31 digits). zzzz = two-way hotline DN. m = one of the following Terminating Modes: H = Hotline (default) N = Non-ringing R = Ringing V = Voice (0)-N = CLID entry, with N = CLID SIZE-1 (SIZE defined in LD 15). D = CLID entry. Search for a CLID entry from key 0 upwards, to find a DN key. The found CLID is used as the CLID entry for the active DN key.
KEY	xx HOT L bbb zzzz (0)-N/D	Two-way Hotline List key, where: xx = key number. bbb = Hot Line List entry (0-999). zzzz = two-way hotline DN. (0)-N = CLID entry, with N = CLID SIZE-1 (SIZE defined in LD 15). D = CLID entry. Search for a CLID entry from key 0 upwards, to find a DN key. The found CLID is used as the CLID entry for the active DN key.

KEY ...	xx ACD aaaa 0-N/D bbbb	ACD key, where: xx = key number. aaaa = ACD DN or Message Center DN. 0-N = CLID entry, with N = CLID SIZE-1 (SIZE defined in LD 15). D = CLID entry. Search for a CLID entry from key 0 upwards, to find a DN key. The found CLID is used as the CLID entry for the active DN key. bbbb = ACD agent's position ID. Please refer to the note at the top of the overlay table, on page 810, that pertains to assigning a CLID entry to an ACD set.

LD 27 – Define the CLID entry for ISDN BRI sets.

Prompt	Response	Description
REQ	NEW CHG	Add new data, or change existing data.
TYPE ...	TSP	Administer the Terminal Service Profile on the Digital Subscriber Loop.
- SPID	xxxxxxx	Service Profile Identifier.
DN ...	xxxx (0)-N	xxxx = DN to be associated with the TSP. (0)-N = CLID entry, with N = CLID SIZE-1 (SIZE defined in LD 15).

Feature operation

There are no operating procedures specified for this feature.

ISDN PRI Central Office Connectivity

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Reference list

The following are the references in this section:

Networking Features and Services (553-2901-301)

Regional material statement

The information presented in this section does not pertain to all market regions. Contact your system supplier or your Nortel Networks representative to verify support of this product in your area.

Feature description

This feature allows the interconnection of the Meridian 1 with public exchanges in the international markets that support the following protocols:

- Asia Pacific, consisting of:
  - Australia (private or alternative carrier)
  - China
  - Hong Kong
  - India
  - Indonesia
  - Japan
  - Malaysia
  - New Zealand
  - Philippines
  - Singapore
  - Taiwan
  - Thailand
- Australia ETSI
- AXE-10 Australia (non-Asia Pacific ISDN Connectivity)
- AXE-10 (Sweden)
- EuroISDN

- Japan D70 (non-Asia Pacific ISDN Connectivity)
- NEAX-61 (New Zealand) (non-Asia Pacific ISDN Connectivity)
- Numeris VN3 (France)
- SwissNet (Switzerland)
- SYS-12 (Norway)
- 1TR6 (Germany)

These connectivities are described in the sections which follow.

Asia Pacific ISDN PRI Central Office Connectivity

Description

The Asia Pacific ISDN PRI Central Office Connectivity provides ISDN Primary Rate Interface (PRI) connectivity between the Meridian 1 and Public Exchange/Central Offices in the following Asia Pacific markets:

- Australia (private or alternative carrier)
- China
- Hong Kong
- India
- Indonesia
- Japan
- Malaysia
- New Zealand
- Philippines
- Singapore
- Taiwan
- Thailand

The Asia Pacific connectivities support the following ISDN features:

- Basic Call Service
- Back-up D-Channel, for Hong Kong

- Advice of Charge, for Japan (considered a basic service)
- Malicious Call Trace, for Australia
- Advice of Charge (AOC) at End of Call, for Australia
- Incoming Trunk Programmable CLID for analog trunks, for Australia. This feature is available for use in a private or alternative carrier network, as required in Australia.
- nB+D, for Japan (up to 215 B-channels/nine interfaces), for New Zealand (up to 120 B-channels/four interfaces), for Malaysia and (up to 120 B-channels/four interfaces),
- Calling Line Identification Presentation and Restriction (CLIP and CLIR)
- Connected Line Identification Presentation and Restriction (COLP and COLR), for India, Philippines, Taiwan, and Indonesia
- Circuit switched voice and data on the B-channel
- Direct Dialing Inward (DDI/DID), for Indonesia
- Overlap Sending (supported by all interfaces except Japan, Philippines)
- Overlap Receiving, for India, Indonesia, China, Malaysia, and Thailand
- COT, DID, DOD, and TIE trunk call types, as applicable
- 64 kbps clear digital information
- Flexible Numbering Plan
- Sub-addressing (supported only when information is received from the Asia Pacific ISDN interfaces and passed through a tandem node)
- Channel Negotiation (for all countries except Singapore. See the note which follows).

  Note: As part of the Singapore enhancement, Channel Negotiation is not supported for Singapore. The CNEG option must be set to 1 (the default) in LD 17.

Interworking is provided with the following other ISDN or non-ISDN interfaces.

- existing ISDN CO connectivities (e.g., NUMERIS, Swiss Net 2)

- Taiwan R1 Modified Signaling
- private networks (e.g., Meridian Customer Defined Network, and QSIG)
- other digital signaling systems (e.g., Digital Private Network Signaling System #1 (DPNSS1), and Digital Access Signaling System #2 (DASS2), and 1.5/2.0 Mb DTI)
- analog signaling systems (Inter Register Multifrequency Compelled signaling (R2/MFC), Multifrequency Compelled Signaling for Socotel (MFE), dial pulse (DP), and Digitone (DTN)

Operating parameters

The Singapore interface complies with the updated national ISDN specification issued by the Telecommunication Authority of Singapore (TAS). This latest specification for Singapore requires that the Channel Negotiation option no longer be supported. Therefore, the CNEG option must be set to 1 (the default) in LD 17 for the Singapore interface type. Also pertaining to the Singapore interface, PROGRESS messages are supported only for BRI (not supported for PRI), and messages with Global Call Reference are supported only for PRI.

The Meridian 1 only supports point-to-point data link connections since PRI only allows a single-point terminal configuration on a user-to-network ISDN interface. BRI supports only point-to-point data link connections.

The ISDN PRI Meridian 1 to Asia Pacific connectivity feature does not support a backup D-channel, except for Hong Kong.

Network Attendant Service (NAS) is not supported across the Asia Pacific interface; however, incoming calls may be routed by NAS from another node.

In a Meridian Customer Defined Network (MCDN), receiving Calling Party Name Display (CPND) from an Asia Pacific ISDN and sending a CPND from an Asia Pacific ISDN are not supported.

Network Call Redirection, Network Call Forward, and Network Call Forward No Answer (MCDN Component) are not supported across an Asia Pacific ISDN interface.

For all of the Asia Pacific interfaces, User-to-User Signalling and Multiple Subscriber Number, Calling Party Name Display, and Call Diversion are not supported.

For all of the Asia Pacific interfaces, the SUSPEND, SUSPEND ACKNOWLEDGE, SUSPEND REJECT, RESUME, RESUME ACKNOWLEDGE, RESUME REJECT call rearrangement messages are not supported.

The Asia Pacific interface does not support the Meridian 1 Packet Handler (MPH) across the CO.

nB+D Primary Rate Access is supported only for Hong Kong, Japan, New Zealand, and Malaysia.

For the Japan interface, Overlap Signaling (Sending and Receiving) is not supported.

For the Hong Kong, Singapore, Australian, and New Zealand interfaces, Overlap Receiving is not supported.

For the Japan interface, Advice of Charge is not provided on BRI terminals.

The following features and capabilities are not supported across any Asia Pacific interface:

- PSTN Equal Access Service - North America Service
- Integrated Service Access (ISA)
- FEX and WATS call types
- Network Wide Ring Again (NRAG)
- Network Calling Party Name Display (NCPND)
- CLID Enhancements (Redirecting Number)
- Network Call Redirection, Network Call Forwarding, Network Call Forward No Answer
- Trunk Optimization/Anti-Tromboning
- ISDN Signaling Link
- RESTART message and INSERVICE message for BRI Trunk Access
- ESN Signaling on PRA (NCOS)

- Virtual Network Services (VNS)

The Malaysia interface does not support RESTART and RESTART ACKNOWLEDGE messages for BRIT.

Hardware requirements

For Options 51C-81C, the following hardware is required:

For Japan, Taiwan, and Hong Kong interfaces:

- For Primary Rate Access, the QPC720 1.5 Mb PRI with the NT6D80AA MSDL card, or the NT5D12AA dual port 1.5 DTI/PRI card with the required NTBK51AA two-port Downloadable D-Channel daughterboard (DDCH).
- For D-Channel processing, the NT6D80AA MSDL card, or the NTBK51AA dual-port Downloadable D-Channel daughterboard (DDCH) to be used as an option to the MSDL with the NT5D12AA dual port 1.5 Mb DTI/PRI.
- For ISDN Basic Rate Access, the NT6D73AA MISP card and the NT6D70BA SILC card.

For Australia, China, Indonesia, Malaysia, New Zealand, Singapore, Thailand, India, and the Philippines:

- For Primary Rate Access, the NT8D72AA PRI2 card, or the NTCK43AA Dual PRI2 card, or the NT5D97AA Dual PRI2/DTI2 card.
- For D-Channel processing, the NT6D80AA Multi-Serial Data Link (MSDL) card, or as an alternative to the MSDL, the NTBK51AA dual-port Downloadable D-Channel Daughterboard (DDCH) to be used with the NTCK43 Dual PRI2 card, or the NT5D97AA Dual PRI2/DTI2 card.
- For ISDN Basic Rate Access, the NT6D73AA MISP card and the NT6D70BA SILC card.
- For Japan, Taiwan, and Hong Kong interfaces, the QPC720 1.5 Mb PRI with the NT6D80AA MSDL card, or the NT5D12AA dual port 1.5 DTI/PRI card with the required NTBK51AA two-port Downloadable D-channel daughterboard (DDCH)

For Option 11C, the following hardware is required:

For Japan, Taiwan, and Hong Kong interfaces:

- For Primary Rate Access, the 1.5 NTAK09AA (DTI/PRI) circuit card is required along with the NTBK51BA Downloadable D-Channel (DCHI) card.
- For Basic Rate Access, the NTBK22AA MISP card and the NT6D70BA SILC card.

For Australia, China, Indonesia, Malaysia, New Zealand, Singapore, Thailand, India, and the Philippines:

- For Primary Rate Access, the NTBK50AA PRI2 card is required along with the NTBK51BA Downloadable D-Channel (DCHI) card
- For Basic Rate Access, the NTBK22AA MISP card and the NT6D70BA SILC card.

Feature interactions

Call Detail Recording

For a simple call, the total cost for the call is produced in the Call Detail Record.

For the Japan connectivity, if a call is redirected, the Call Detail Recording (CDR) records show all extensions associated with the particular call, however, it is not possible to show call costs associated with each extension. This is because the CDR reports which pertain to the Japan protocol (used for the Japan interface), charge information only at the point when the call is disconnected.

Calling Line Identification Enhancements

Prior to the CLID Enhancements feature, the Customer Data Block (Overlay 15) contained the prompts PFX1 and PFX2 (for Prefix 1 and Prefix 2) that were used to construct the CLID. The combination of PFX1, PFX2 and the originating DN were used to construct a correct number for the called party to dial in order to reach the calling party. If no digits are configured for either of the prefixes, then that part of the number will not be included in the Calling Party Number. Essentially, this meant that the CLID could only be built from key 0 of a set. Regardless of what key was used to make a call, it was the CLID for key 0 that was sent. Also, only one office code and one location code could have been assigned in the CLID for a customer.

With the introduction of the ISDN CLID Enhancements feature, PFX1 and PFX2 are no longer used to construct the CLID. CLID is now table-driven (when Overlay 15 is loaded, a customer can configure a CLID table), and virtually any of the information contained in the fields of the CLID table can now be programmed against any DN or DN key, on a per set basis. This means that the CLID that is sent from a set is now predicated on what is in the CLID table, rather than the LDN or PDN. That is, a CLID for any key is now built by taking the information contained in a particular field in the CLID table and adding that information to the key's DN. A multi-line set can now have DN keys that each has their own CLID. Or, the CLID of any one key on a set could be programmed to use the CLID of any other key on the set.

The construction of CLID is based on the CPFXS prompt in Overlay 16. If CPFXS = NO, then when constructing the Calling Number, the prefixes are retrieved from the Route Data Block via the responses to the HNTN and HLCL prompts. If CPFXS = YES, which is the default response, then CLID is built depending upon the prefixes HNTN and HLCL retrieved from the Customer Data Block (Overlay 15) via the entries in the CLID table (refer to the paragraph above for more details).

Also, the Meridian 1 can now support multiple office codes, location codes and steering codes in CLID. This means that any telephone set on one Meridian 1 can send a CLID that will have calls returned to another Meridian 1. This type of configuration is typically used in cases where a customer wants calls to be returned to only one central location.

How a CLID table is built

Prompts have been added to Overlay 15 that create a CLID table for a customer. This table contains up to 4,000 CLID "entries." Each entry contains unique information pertaining to CLID, as explained in the following sections.

For users of a North American Numbering Plan, the Meridian 1 now supports multiple Home Central Office Codes (HNXXs), Home Numbering Plan Area (HNPA) codes, Home Location Codes (HLOCs) and Local Steering Codes (LSCs), on a DN or DN key basis.

For a North American Numbering Plan, each CLID entry can contain the following:

- a 1 - 6 digit national code for a home national number (HNTN)

- a 1 - 12 digit local code for a home local number (HLCL), or a one-12 digit Listed Directory Number for a switchboard
- a 1 - 7 digit Home Location Code (HLOC)
- a 1 - 7 digit Local Steering Code (LSC)

For users of an International Numbering Plan, the Meridian 1 now supports multiple Prefix 1 (PFX1) and Prefix 2 (PFX2) contents, and multiple Home Location Codes (HLOCs) and Local Steering Codes (LSCs), on a DN or DN key basis.

For an International Numbering Plan, each CLID entry can now contain the following:

- a 1 -6 digit national code for a home national number (HNTN), which is the equivalent of PFX1
- a 1 -12 digit local code for a home local number (HLCL), which is the equivalent of PFX2, or a one-12 digit Listed Directory Number for a switchboard
- a 1- 7 digit Home Location Code (HLOC)
- a 1 -7 digit Local Steering Code (LSC)

Another new capability, which applies to both the North American Numbering Plan and the International Numbering Plan, pertains to how the HLCL is constructed. A new prompt, DIDN (which signifies “use DN as a DID number”) in Overlay 15, allows the HLCL to be built either using the digits in the HLCL plus the digits of the active key (if DIDN is set to YES, the DN is considered to be a DID number and is included in the CLID), or only the digits in the HLCL (if DIDN is set to NO, the DN is not included in the CLID since it is not a DID number), or based on a search on the DN keys, beginning from key 0, to find the CLID to be used (DIDN is set to SRCH.)

For more detailed information, please refer to the “ISDN CLID Enhancements” feature module in *Networking Features and Services* (553-2901-301).

Connected Line Identification Presentation and Restriction (COLP and COLR)

Connected Line Identification Presentation and Restriction (COLP and COLR) are applicable only for Indonesia, India, Taiwan, and Philippines.

The Connected Line Identification Restriction (COLR) supplementary service takes precedence over the COLP supplementary service. The COLP service can take precedence over COLR service if the calling user has an override category.

The same Class of Service is used to control both Connected Line Identification Restriction and Calling Line Identification Restriction (CLIR). Thus, if a user has presentation restricted configured, their number is sent to the other party for both incoming and outgoing calls with the presentation flag set to restricted.

Electronic Switched Network (ESN)

Basic Alternate Route Selection (BARS)

BARS interacts with the Asia Pacific ISDN interface as follows:

- NPA and NXX cannot be used on the Asia Pacific ISDN interface, as the public network cannot accept them
- Special Numbers (SPNs) are converted to “unknown” type and plan, as the Electronic Switched Network (ESN) SPN is a North American concept

Network Alternate Route Selection (NARS)

All of the BARS concerns apply to NARS.

In addition, LOC codes must be used with care, since the networking features do not accept a Digit Manipulation Index (DMI) used to insert an Electronic Switched Network (ESN) access code. Therefore, the only supported usage has the trunks effectively being treated as though they are non-ISDN.

Coordinated Dialing Plan

A Coordinated Dialing Plan (CDP) call can access an Asia Pacific trunk. However, since neither the private plan nor the CDP numbering type is supported by the Asia Pacific ISDN, these are converted to a type and plan supported by the public network.

DPNSS Gateway

The Asia Pacific interface interacts with the DPNSS gateway in a manner consistent with other PSTN interfaces. The Information Elements (IEs) supported on the Asia Pacific interface, which have equivalents in DPNSS interwork are translated on an IE by IE basis. IEs which have no matching DPNSS element are discarded. The same is true for DPNSS to Asia Pacific. Supported IEs with DPNSS equivalents pass through with appropriate mapping.

Incoming Digit Conversion

The Asia Pacific interface supports Incoming Digit Conversion ISDN DID routes.

The Incoming Digit Conversion (IDC) feature provides the availability to convert the incoming digits from a DID route. Digits received as a called party number are converted if the IDC feature is activated on the route. Digit analysis is then performed on the converted digits by the Meridian 1.

MCDN Call Redirection (Call Forward, Hunt, Call Forward No Answer)

These features operate in the same manner as when a call to a set is redirected over any other Central Office trunk; however, notices of redirection or modification are not transferred.

nB+D

For the Malaysia and New Zealand connectivities, the channel identification scheme used must be changed from implicit to explicit.

Outpulsing of Asterisk and Octothorpe

The Outpulsing of Asterisk and Octothorpe is not supported for any Asia Pacific interface.

PRI Channel Negotiation

This interaction is applicable to the Japan interface only. When a D-channel has one or more secondary PRIs associated with it while using the Japan interface, channel negotiation requires that the PRI interface be identified (implicitly) in the channel interface IE for all B-channels not on the primary interface whether secondary loops are configured or not.

Trunk Optimization

Trunk Optimization is not supported across the Asia Pacific interface, but interworks transparently. In other words, trunk optimization will not be observed at the Asia Pacific ISDN. The call will appear to be static, not undergoing any modifications.

T309 Timer

The Meridian 1 supports the T309 timer on PRI trunks for all Asia Pacific interfaces.

Virtual Network Services (VNS)

It is not possible to configure an Asia Pacific D-channel as a VNS D-channel. However, the voice connection through the Public Exchange of a VNS call may use a PRI COT or DID as a virtual TIE trunk.

Feature packaging

There are no new software packages required for this feature. However, the following packages are necessary in order to connect the Meridian 1 over an Asia Pacific ISDN PRI interface to a Central Office:

- Digit Display (DDSP) package 19
- 1.5 Mb Digital Trunk Interface (PBXI) package 75
- Integrated Services Digital Network (ISDN) package 145
- For Japan, Taiwan and Hong Kong, 1.5 Mb Primary Rate Access (PRA) package 146
- For Australia, China, Indonesia, Malaysia, New Zealand, Singapore, Thailand, India, and the Philippines, 2.0 Mb Primary Rate Interface (PRI2) package 154, which has the following dependencies:
  - 2.0 Mb Digital Trunk Interface (DTI2) package 129
  - Integrated Services Digital Network (ISDN) package 145
- International Primary Rate Access (IPRA) package 202, which has the following dependencies:
  - Digit Display (DDSP) package 19
  - Integrated Services Digital Network (ISDN) package 145
  - 2.0 Mb Primary Rate Interface (PRI2) package 154

- Meridian 1 Extended Peripheral Equipment (XPE) package 203
- Multi-Purpose Serial Data Link (MSDL) package 222, which requires the Integrated Services Digital Network (ISDN) package 145
- New Format CDR (FCDR) package 234

For Basic Rate Interface trunk access the following packages are required instead of the PRI-related packages:

- Basic Rate Interface (BRI) package 216
- Basic Rate Interface Trunk (BRIT) package 233

If the call is to interwork with any other trunk, the Universal ISDN Gateway (UIGW) package 283 is required.

For nB+D, the International nB+D (INBD) package 255 is required.

The Overlap Signaling feature requires:

- Basic Routing (BRTE) package 14
- Network Class of Service (NCOS) package 32
- Basic Alternate Route Selection (BARS) package 57, Network Alternate Route Selection (NARS) package 58, and/or Coordinated Dialing Plan (CDP) package 59
- Flexible Numbering Plan (FNP) package 160
- Overlap Signaling (OVLP) package 184

  Note: This package should not be enabled for the Philippines

- Basic Queuing (BQUE) package 28

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 15 – Configure the Customer Data Block for Asia Pacific with Calling Line Identification.

2 LD 17 – Configure the Asia Pacific D-channel.

3 LD 17 – Configure a Back-up D-Channel for Hong Kong.

4 LD 17 – Configure nB+D for Hong Kong, Japan, New Zealand, and Malaysia.

5 LD 17 – Configure the Bearer Capability for the Asia Pacific connectivity D-Channel.

6 LD 16 – Configure Asia Pacific ISDN PRI Route Data Block.

7 LD 14 – Configure Asia Pacific ISDN PRI trunks.

8 LD 73 – Define the frame format and grade of service timers for a PRI/PRI2 loop.

LD 15 – Configure the Customer Data Block for Asia Pacific with Calling Line Identification.

Prompt	Response	Description
REQ:	CHG	Change existing data.
TYPE:	NET	Networking data (if REQ = CHG only.)
CUST	xx	Customer number. xx = 0-99 for Options 51C-81C. xx = 0-31 for Option 11C.
OPT	a...a	Options.
AC2	aaaa	Access Code 2 as defined in LD 86 (aaaa = NPA, NXX, INTL, SPN, or LOC).
...		
CLID	YES	Configure CLID option for Asia Pacific.
- SIZE	0-(256)-4000	The maximum number of CLID entries needed for a customer. ***Note:*** Do not define a size much larger than actually needed. This entry may be increased or decreased as required.
- INTL	0-9999	Country code, for international number.

- ENTRY	aaaa Xaaaa Xaaaa Xbbbb	aaaa = CLID entry to be configured. Xaaaa = CLID entry to be deleted. Xaaaa Xbbbb = CLID entries to be deleted. aaaa and bbbb must be a value between 0 and (SIZE-1). The ENTRY prompt is repeated until <CR> is entered as a response. If REQ = CHG, as many entries as needed may be created, changed or deleted. The action for the entry is saved to system memory after the CLID entry has been completely configured. That is, after the LSC prompt has been answered. If a new CLID entry is created, or an existing CLID entry is changed, the message “ENTRY aaaa SAVED” is displayed after the LSC prompt. If a CLID entry or CLID entries is/are deleted, the message “ENTRY aaaa DELETED” or “ENTRIES aaaa-bbbb DELETED” is displayed after the LSC prompt.
- - HNTN	0-999999	National code for home national number (1-6 digits).
- - HLCL	0-999..9	Local code for home local number or Listed Directory Number (1-12 digits).
- - DIDN		How to use the DN as a DID when constructing a CLID national or local number.
	(YES)	The CLID is constructed using the digits defined in HLCL followed by the DN of the active key (default).
	NO	Construct the CLID using the digits defined in HLCL.
	SRCH	Search on the set, from key 0 - upwards, to find a CLID entry which has the DIDN set to YES. Use the found CLID to construct the local number.
- - HLOC	0-9999999	Home location code (ESN), 1-7 digits.
- - LSC	0-9999999	Local steering code, 1-7 digits.
ISDN	YES	Integrated Services Digital Network.
- PNI	1-327000	Private Network Identifier.
ENTRY aaaa SAVED ENTRY aaaa DELETED ENTRIES aaaa-bbbb DELETED		Displayed message appears after each entry is input.

LD 17 – Configure the Asia Pacific D-channel.

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	CFN	Configuration data block.
- ADAN	NEW DCH xx	Add a D-channel on logical port 0-63 (51C-81C).
	NEW DCH xx	Add a D-channel on logical port 0-15 (Option 11C).
- CTYP	MSDL	Card type where: MSDL = The NT6D80 Multi-purpose Serial Data Link or the NTBK51AA Downloadable D-Channel Daughterboard for Options 51C-81C. MSDL = The NTBK51BA Downloadable D-Channel Daughterboard for Option 11C.
- GRP	0-4	Network group number for Option 81C systems.
- DNUM	0-15	Device number for I/O ports. All ports on the MSDL card share the same DNUM. The MSDL card address settings must match the DNUM value.
- CDNO	1-9	The card number of the Downloadable D-Channel Daughterboard, for Option 11C.
- PORT	0-3 1	Port number on MSDL cards. For Option 11C.
- DES	a...a	Designator. DES is used to identify the link and can be up to 16 alphanumeric characters: 0-9, and upper case A-Z. Characters “*” and “#” are not allowed.
- USR	PRI	This D-channel is used for Primary Rate only.
- IFC	APAC	Asia Pacific ISDN interface.

- - CNTY		Country associated with the APAC interface.
	AUST	Australia.
	CHNA	China.
	HKNG	Hong Kong.
	INDI	India.
	INDO	Indonesia.
	JAPN	Japan.
	MSIA	Malaysia.
	PHLP	Philippines.
	SING	Singapore.
	TAIW	Taiwan.
	TCNZ	New Zealand.
	THAI	Thailand.
- - ISDN_MCNT	60-(300)-350	Layer 3 call control message count per 5 second time interval.
CLID	OPT4	OPT4 is the default for all Asia Pacific interface.
PROG		Progress signal.
	NCHG	No Change. This is the default for all Asia Pacific interfaces except Singapore, Japan, and Australia.
	MALE	Alert message.
	MCON	Connect message. This is the default for the Australia interface.
		Note: The PROG prompt should not be configured for Japan and Singapore, since these countries do not support the Progress signal.
- DCHL	0-159	PRI/PRI2 loop number for D-channel (Options 51C - 81C).
	1-9	PRI/PRI2 loop number for D-channel (Option 11C).
- CNEG		Channel negotiation option.
	(1)	Channel is indicated and no alternative acceptable, exclusive.
	2	Channel is indicated and any alternative acceptable, preferred.
		Note: for the Singapore interface, CNEG must be set to 1.
- RLS	xx	Software release of the far end switch. If the far end has an incompatible release, it prevents the sending of application messages.

- RCAP		Remote capabilities, to configure the Connected Line ID Presentation supplementary service.
	(XCOL) COLP	To remove COLP. CLID Presentation supported. This prompt appears if CNTY = Indonesia, India, Taiwan, and the Philippines.
...		
- OVLR	YES	Allow Overlap Receiving. This prompt applies only if CNTY = THAI, MSIA, INDI, INDO, or CHNA.
- - DIDD	(0)-15	Number of leading digits to delete from DID trunks.
- OVLS	(NO) YES	(Do not) allow Overlap Sending. Enter NO for Japan and Philippines. Enter YES for all other interfaces.
- - OVLT	(0)-8	Overlap Timer in seconds. This timer controls the interval between the sending of INFORMATION messages. “0,” the default, means send immediately.
- TIMR	YES	Change programmable timers. Only supported for interfaces supporting one of the following timers.
- - T310	10-(10)(30)-60	Maximum time in seconds between an incoming CALL PROCEEDING message and the next incoming message. Not supported for Australia. Default values are as follows: CHNA = 30 seconds. TAIW = 30 seconds. PHLP = 10 seconds. HKNG = 10 seconds. INDI = 10 seconds. INDO = 10 seconds. JAPN = 10 seconds. MSIA = 10 seconds. SING = 10 seconds. TCNZ = 10 seconds. THAI = 10 seconds.

- - INC_T306	0-(2)-240	Variable timer for received DISCONNECT message on incoming calls allowing in-band tone to be heard when the network sends in-band tone. T306 is the duration of the network timer in seconds. The network will stop sending after T306 times out, so the maximum time will be T306. The value is stored in two-second increments, which are rounded up.
- - OUT_T306	0-(30)-240	Variable timer for received DISCONNECT message on outgoing calls allowing in-band tone to be heard when the network sends in-band tone. T306 is the duration of the network timer in seconds. The network will stop sending after T306 times out, so the maximum time will be T306. The value is stored in two-second increments, which are rounded up.
- LAPD	YES	Allows the changing of the layer 2 timer. NO = Do not allow the changing of the layer 2 timer (default).
...		
PARM	YES	Change system parameters.
FCDR	NEW	Use new CDR format (recommended for Japan).
OCAC	YES	Support the Original Carrier Access Code format. NO = Do not support the Original Carrier Access Code format (default).
MTRO	(MR) PPM	Message Registration (default). Periodic Pulse Metering.

LD 17 – Configure a Back-up D-Channel for Hong Kong.

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	ADAN	Action device and number.
- ADAN	NEW BDCH xx	Add a Back-up D-Channel on logical port 0-63, for Options 51C-81C
	NEW BDCH xx	Add a Back-up D-Channel D-Channel on logical port 0-15, for Option 11C.
- PDCH	xx	Primary D-Channel associated with the Backup D-Channel. The value must be the same as the one entered for the Primary D-Channel. xx = 0-63 for Options 51C-81C. xx = 0-15 for Option 11C.
- CTYP	MSDL	Card type where: MSDL = The NT6D80 Multi-purpose Serial Data Link or the NTBK51AA Downloadable D-Channel Daughterboard for Options 51C-81C. MSDL = The NTBK51BA Downloadable D-Channel Daughterboard for Option 11C.
- GRP	0-4	Network group number for Option 81C systems.
- DNUM	0-15	Device number for I/O ports. All ports on the MSDL card share the same DNUM. The MSDL card address settings must match the DNUM value.
- CDNO	1-9	The card number of the Downloadable D-Channel Daughterboard, for Option 11C.
- PORT	0-3	Port number on the NT6D80 MSDL card, if the MSDL is used for D-Channel handling on large systems (Options 51C-81C).
...		

	0-1	Port number of the NTBK51AA, if the NTBK51AA is used for D-Channel handling on large systems (Options 51C, 61C, 81C). Port 0 of the NTBK51AA can only be defined to work with Loop 0 of the NT5D97AA DDP2 card, and Port 1 of the NTBK51AA can only be defined to work with Loop 1 of the NT5D97AA. This relationship must be reflected in the BCHL prompt, which follows later (either 0 or 1 must be entered when specifying the loop number used by the Backup D-Channel).
	1	Port number of the NTBK51BA, for Option 11C.
- RCVP	YES	Auto-recovery to primary D-Channel.
	1-9	PRI/PRI2 loop number for D-channel (Option 11C).
...		
- USR	PRI	This D-Channel is used for Primary Rate only.
- IFC	APAC	Asia Pacific ISDN interface.
- - CNTY	HKNG	Hong Kong
...		
PROG	 NCHG MALE MCON	Progress signal. NCHG = No Change. This is the default for all Asia Pacific interfaces except Australia (and Japan and Singapore, which do not support the Progress signal for PRI). MALE = Alert message. MCON = Connect message. This is the default for the Australia interface. ***Note:*** The PROG prompt should not be configured for Japan and Singapore, since these countries do not support the Progress signal.
- RCVP	YES	Auto-recovery to primary D-Channel.
- BCHL	0-159	PRI2 loop number for the Back-up D-channel, for large systems (Options 51C-81C). If the NTBK51AA is used for D-Channel handling, only loop 0 or 1 can be configured.

...	1-9	PRI/PRI2 loop number for D-channel (Option 11C).

LD 17 – Configure nB+D for Hong Kong, Japan, New Zealand, and Malaysia.

Note: The International nB+D (INBD) package 255 must be enabled to configure nB+D.

Prompt	Response	Description
REQ	CHG	Add existing data Change existing data.
TYPE	ADAN	Action device and number.
- ADAN	NEW DCH xx	Add a primary D-Channel on logical port 0-63, for Options 51C-81C.
	NEW DCH xx	Add a primary D-Channel D-Channel on logical port 0-15, for Option 11C.
- CTYP	MSDL	Card type where: MSDL = The NT6D80 Multi-purpose Serial Data Link or the NTBK51AA Downloadable D-Channel Daughterboard for Options 51C-81C. MSDL = The NTBK51BA Downloadable D-Channel Daughterboard for Option 11C.
- GRP	0-4	Network group number for Option 81C systems.
- DNUM	0-15	Device number for I/O ports. All ports on the MSDL card share the same DNUM. The MSDL card address settings must match the DNUM value.
	1-10	The card number of the Downloadable D-Channel Daughterboard, for Option 11C.
- PORT	0-3	Port number on the NT6D80 MSDL card, if the MSDL is used for D-Channel handling, for Options 51C-81C.

	0-1	Port number of the NTBK51AA, if the NTBK51AA is used for D-Channel handling on large systems (Options 51C-81C). Port 0 of the NTBK51AA can only be defined to work with Loop 0 of the NT5D97AA DDP2 card, and Port 1 of the NTBK51AA can only be defined to work with Loop 1 of the NT5D97AA. This relationship must be reflected in the BCHL prompt, which follows later (either 0 or 1 must be entered when specifying the loop number used by the Backup D-Channel).
	1	Port number of the NTBK51BA, for the small system (Option 11C).
- DES	aaa...a	Designator. DES is used to identify the link and can be up to 16 alphanumeric characters: 0-9, and upper case A-Z. Characters “*” and “#” are not allowed.
- USR	PRI	This D-Channel is used for Primary Rate only.
- IFC	APAC	Asia Pacific ISDN interface.
- - CNTY	HKNG MSIA JAPN TCNZ	Hong Kong. Malaysia. Japan. New Zealand.
...		
- DCHL	LOOP ID 0-159 (0)-15	Primary PRI loop number and interface identifier for the D-Channel (Options 51C-81C). ***Note:*** the INBD package 255 must be enabled to allow this range of entry. If the INBD package is not enabled, the allowable entry would be the PRI loop number (0-159 for Options 51C-81C, 1-9 for Option 11C). Also, the subsequent PRI prompt(s) would not be generated.
	LOOP ID 1-9 (0)-15	Primary PRI loop number and interface identifier for the D-Channel (Option 11C).

- PRI	LOOP ID 0-159 (0)-15	Secondary PRI loop number and interface identifier (Options 51C-81C). Prompted if INBD package 255 is enabled. The values entered must be different than those entered for the loop number and interface identifier at the DCHL prompt. The PRI prompt is generated until <CR> is entered.
	LOOP ID 1-9 (0)-15	Secondary PRI loop number and interface identifier (Option 11C). Prompted if INBD package 255 is enabled. The values entered must be different than those entered for the loop number and interface identifier at the DCHL prompt.
- PRI	<CR>	

LD 17 – Configure the Bearer Capability for the Asia Pacific connectivity D-Channel.

Prompt	**Response**	**Description**
REQ	CHG	Change existing data.
TYPE	PARM	Make changes to system parameters.
...		
- BCAP	a...a	Bearer Capability. a...a = SPEECH (the default) or 3.1 Khz data.
...		

LD 16 – Configure Asia Pacific ISDN PRI Route Data Block.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	RDB	Route Data Block.
CUST	xx	Customer number, as defined in LD 15.
ROUT	0-511 0-127	Route number, for Options 51C-81C. For Option 11C.
TKTP	TIE COT DID	TIE trunk type. Central Office Trunk type. Direct Inward Dialing trunk type.
...		
DTRK	YES	Digital trunk route.
- DGTP	PRI	PRI digital trunk type for TAIW, HKNG and JAPN.
	PRI2	PRI digital trunk type for AUST, CHNA, INDI, INDO, SING, THAI, TCNZ, MSIA, and PHLP.
...		
- ISDN	YES	Integrated Services Digital Network.
- MODE	PRA	ISDN PRI route.
- IFC	APAC	Asia Pacific ISDN interface.

- - CNTY		Country associated with the APAC interface.
	AUST CHNA HKNG INDI INDO JAPN MSIA PHLP SING TAIW TCNZ THAI	Australia. China. Hong Kong. India. Indonesia. Japan. Malaysia. Philippines. Singapore. Taiwan. New Zealand. Thailand.
...		
CPFXS		Customer-defined Prefixes option.
	NO	If CPFXS = NO, when constructing the Calling or Connected Line Identification, the prefixes are retrieved from the Route Data Block via the HNTN and HLCL prompts which follow. Enter NO for APAC.
	(YES)	If CPFXS = YES, when constructing the Calling or Connected Line Identification, the prefixes are retrieved from the Customer Data Block via the HNTN and HLCL prompts in LD 15, as is currently done. This is the default response.
HNTN	0-9999	This prompt applies to APAC only if CPFXS = NO. Home National Number. This number is similar to the PFX1 number prompted in LD 15. It is added to this overlay so that this prefix can be configured on a route basis. As is the case with PFX1, the HNTN prefix can be from one-to-four digits long.
HLCL	0-9999	This prompt applies to APAC only if CPFXS = NO. Home Location Number. This number is similar to the PFX2 number prompted in LD 15. It is added to this overlay so that this prefix can be configured on a route basis. As is the case with PFX2, the HLCL prefix can be from one-to-four digits in length.
...		

ICOG	 IAO ICT OGT	Incoming and/or Outgoing trunk. The trunk is Incoming and Outgoing. The trunk is Incoming only. The trunk is Outgoing only.
...		
ACOD	x...x	The Access Code for the trunk route. The ACOD must not conflict with the existing numbering plan.
CDR	YES	Call Detail Recording if the AOC display is desired in the call record.
- - OTL	YES	CDR on outgoing toll calls.
- - OAN	YES	CDR on all answered outgoing calls.
...		
MR	ENDC	AOC at end of call.
RUCS	1	Route unit cost - value received is treated as charged.
RUCF	1 0	Route unit conversion factor - no conversion required.
...		
MCTS	YES	Enable Malicious Call Trace signaling for AUST.
- MCTM	(0)-30	Malicious Call Trace request timer is defined in seconds. This is the disconnection delay which is used. It overrides T306 for calls to/from Malicious Call Trace capable sets (for AUST).
- MTND	(NO) YES	Malicious Call Trace disconnect delay for tandem calls (for AUST).

LD 14 – Configure Asia Pacific ISDN PRI trunks.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	TIE COT DID	TIE trunk data block. Central Office Trunk data block. Direct Inward Dialing trunk data block. ***Note:*** Must match TKTP defined in LD 16.
TN	l ch c u	Loop and channel for digital trunks, where: l = Previously defined PRI/PRI2 loops. ch = channel 1-24 for 1.5 Mb DTI/PRI or 1-30 for 2.0 Mb DTI/PRI For Option 11C.
CUST	xx	Customer number, as defined in LD 15. xx = 0-99 for Options 51C-81C xx = 0-31 for Option 11C.
RTMB	0-511 1-510 0-127 1-510	Route number and member number. For Option 11C.
TGAR	0 - (1) - 31	Trunk Group Access Restriction The default of 1 automatically blocks direct access.

LD 73 – Define the frame format and grade of service timers for a PRI/PRI2 loop.

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	PRI PRI2	PRI loop. PRI2 loop.
FEAT	LPTI	Set the timers for PRI2 loop.
LOOP	xxx	PRI/PRI2 loop number.
MFF	(AFF) CRC	Alternate frame format (default). CRC-4 frame format.
ACRC	(NO) YES	NO = No automatic reporting of CRC-4 errors during transmission. Automatic reporting of CRC-4 errors during transmission.
ALRM	(REG) ALT	Regular mode of firmware alarm version (default). Alternate mode of firmware alarm version.
RAIE	(NO) YES	Disable RAIE Group II alarm state (default). Enable RAIE Group II alarm state.
...		
PERS	0-(50)-256	Persistence timer for Group II problems (2 ms increments).
CLEA	0-(50)-256	Clearance timer for Group II problems (2 ms increments).

Feature operation

No operating procedures are required to use this feature.

Australia ETSI

Description

The Australia ETSI feature supports 2.0 Mb ISDN Primary Rate Interface and Basic Rate Interface Trunk connectivity for the Australian Central Office, in compliance with the Australia ETSI specification (Telstra).

This feature uses the existing EuroISDN software packages to provide the basic ISDN capabilities and supplementary services listed below (EURO is configured as the interface in the overlay programs when configuring PRI2 and BRI).

Basic ISDN services:

- 2.0 Mb PRI and BRI Basic Call Service
- Circuit-mode bearer capabilities (speech, 3.1 kHz audio, 64 kbps digital, and adapted 56 kbps to 64 kbps digital)
- COT, DID, DOD, and TIE trunk call types
- Calling Line Identification (public and private)
- Enbloc Sending
- Overlap Sending
- Channel Negotiation

Supplementary services:

- Calling Line Identification Presentation (CLIP)
- Calling Line Identification Restriction (CLIR)
- Connected Line Identification Presentation (COLP)
- Connected Line Identification Restriction (COLR)
- Malicious Call Trace
- Advice of Charge (AOC), during call set-up, during the call, and at end of call
- Sub-addressing (SUB)
- Direct Dial In (DDI)

Operating parameters

This feature requires downloadable D-Channel handling, for both the large systems (Options 51C, 61C, 81C) and the small system (Option 11C). Therefore, the NT6D11 DCHI is not supported on large systems. The NTAK79AA PRI2 card is not supported on Option 11C because it has an on-board DCHI, and does not use the NTBK51downloadable D-Channel daughterboard.

Overlap Receiving is not supported.

Basic Alternate Route Selection (BARS) is not supported. Network Alternate Route Selection (NARS) is.

In a Meridian Customer Defined Network (MCDN), receiving Calling Party Name Display (CPND) and sending a CPND are not supported

MCDN Call Redirection (Call Forward, Call Forward No Answer, Hunt) is not supported.

MCDN Call Modification (Conference, Transfer) is not supported.

Network Call Redirection, Network Call Forward, and Network Call Forward No Answer (MCDN Component) are not supported.

Network Attendant Service (NAS) features are not supported across the Australia ETSI interface; however, incoming calls may be NAS routed from another node.

Trunk Route Optimization is not supported across the Australia ETSI interface.

All operating parameters apply to feature as for the EuroISDN Advice of Charge and Malicious Call Trace functionalities.

The Advice of Charge functionality is supported on a system basis only. It is not supported on a per call basis.

Reverse Charging is not supported, nor is requesting charging information from the user's side.

Tandeming of Advice of Charge charging information across a Meridian 1 network is not supported.

The display of charges is not supported on BRI sets and terminals.

Packet data handling is not supported for the BRI component of this feature.

Feature interactions

Calling Line Identification Enhancements

Prior to the CLID Enhancements feature, the Customer Data Block (Overlay15) contained the prompts PFX1 and PFX2 (for Prefix 1 and Prefix 2) that were used to construct the CLID. The combination of PFX1, PFX2 and the originating DN were used to construct a correct number for the called party to dial in order to reach the calling party. If no digits are configured for either of the prefixes, then that part of the number will not be included in the Calling Party Number. Essentially, this meant that the CLID could only be built from key 0 of a set. Regardless of what key was used to make a call, it was the CLID for key 0 that was sent. Also, only one office code and one location code could have been assigned in the CLID for a customer.

With the introduction of the ISDN CLID Enhancements feature, PFX1 and PFX2 are no longer used to construct the CLID. CLID is now table-driven (when Overlay 15 is loaded, a customer can configure a CLID table), and virtually any of the information contained in the fields of the CLID table can now be programmed against any DN or DN key, on a per set basis. This means that the CLID that is sent from a set is now predicated on what is in the CLID table, rather than the LDN or PDN. That is, a CLID for any key is now built by taking the information contained in a particular field in the CLID table and adding that information to the key's DN. A multi-line set can now have DN keys that each has their own CLID. Or, the CLID of any one key on a set could be programmed to use the CLID of any other key on the set.

The construction of CLID is based on the CPFXS prompt in Overlay 16. If CPFXS = NO, then when constructing the Calling Number, the prefixes are retrieved from the Route Data Block via the responses to the HNTN and HLCL prompts. If CPFXS = YES, which is the default response, then CLID is built depending upon the prefixes HNTN and HLCL retrieved from the Customer Data Block (Overlay 15) via the entries in the CLID table (refer to the paragraph above for more details).

Also, the Meridian 1 can now support multiple office codes, location codes and steering codes in CLID. This means that any telephone set on one Meridian 1 can send a CLID that will have calls returned to another Meridian 1. This type of configuration is typically used in cases where a customer wants calls to be returned to only one central location.

How a CLID table is built

Prompts have been added to Overlay 15 that create a CLID table for a customer. This table contains up to 4,000 CLID "entries." Each entry contains unique information pertaining to CLID, as explained in the following sections.

For users of an International Numbering Plan, the Meridian 1 now supports multiple Prefix 1 (PFX1) and Prefix 2 (PFX2) contents, and multiple Home Location Codes (HLOCs) and Local Steering Codes (LSCs), on a DN or DN key basis.

For an International Numbering Plan, each CLID entry can now contain the following:

- a 1 -6 digit national code for a home national number (HNTN), which is the equivalent of PFX1
- a 1 -12 digit local code for a home local number (HLCL), which is the equivalent of PFX2, or a one-12 digit Listed Directory Number for a switchboard
- a 1- 7 digit Home Location Code (HLOC)
- a 1 -7 digit Local Steering Code (LSC)

Another new capability pertains to how the HLCL is constructed. A new prompt, DIDN (which signifies "use DN as a DID number") in Overlay 15, allows the HLCL to be built either using the digits in the HLCL plus the digits of the active key (if DIDN is set to YES, the DN is considered to be a DID number and is included in the CLID), or only the digits in the HLCL (if DIDN is set to NO, the DN is not included in the CLID since it is not a DID number), or based on a search on the DN keys, beginning from key 0, to find the CLID to be used (DIDN is set to SRCH).

For more detailed information, please refer to the "ISDN CLID Enhancements" feature module in *Networking Features and Services* (553-2901-301)

Connected Line Identification Presentation and Restriction (COLP and COLR)

The Connected Line Identification Restriction (COLR) supplementary service takes precedence over the COLP supplementary service. The COLP service can take precedence over COLR service if the calling user has an override category.

The same Class of Service is used to control both Connected Line Identification Restriction and Calling Line Identification Restriction (CLIR). Thus, if a user has presentation restricted configured, their number is sent to the other party for both incoming and outgoing calls with the presentation flag set to restricted.

Coordinated Dialing Plan (CDP)

A Coordinated Dialing Plan (CDP) can be used to access an Australia ETSI trunk. However, neither the CDP private plan nor the CDP numbering type is supported. They get converted to unknown plan and type, respectively.

Virtual Network Services (VNS)

It is not possible to configure an Australia ETSI D-channel as a VNS D-channel. However, the voice connection through the Public Exchange of a VNS call may use a PRI/BRI COT or DID as a virtual TIE trunk.

Feature packaging

There are no new software packages required for this feature. However, the following packages are necessary in order to connect the Meridian 1 over an Australia ETSI PRI2/BRI interface to a Central Office.

For PRI2 connectivity:

- Integrated Services Digital Network (ISDN) package 145
- 2.0 Mb Primary Rate Interface (PRI2) package 154
- Overlap Signaling (OVLP) package 184
- International Primary Rate Access (IPRA) package 202
- Multi-Purpose Serial Data Link (MSDL) package 222

If the call is to interwork with any other trunk, the Universal ISDN Gateway (UIGW) package 283 is required.

For the Advice of Charge capability:

- Controlled Class of Service (CCOS) package 81
- Background Terminal (BGD) package 99
- Periodic Pulse Metering/Message Registration (MR) package 101
- International Supplementary Features (SUPP) package 131

For the Malicious Call Trace capability:

- Controlled Class of Service (CCOS) package 81
- Malicious Call Trace (MCT) package 107
- International Supplementary Features (SUPP) package 131
- Flexible Features Code (FFC) package 139
- Network Attendant Service (NAS) package 159
- ISDN Supplementary Features (ISDN INTL SUPP) package 161

For ISDN Basic Rate Interface Trunking connectivity:

- Basic Rate Interface (BRI) package 216
- Basic Rate Interface Trunk (BRIT) package 233

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 17 – Configure a PRI2 loop for the ETSI Australian ISDN connectivity.

2 LD 17 – Configure the D-channel for ETSI Australian ISDN connectivity.

3 LD 16 – Configure the ETSI Australian ISDN PRI2 Route Data Block.

4 LD 14 – Configure the Australia ETSI ISDN PRI2 trunks.

5 LD 17 – Configure Advice of Charge for Australia ETSI.

6 LD 15 – Allow Charge Display and CDR Charge.

7 LD 10 – Assign meters to analog (500/2500) sets.

8 LD 11 – Assign meters to Meridian proprietary sets.

9 LD 16 – Allow Advice of Charge on the route configured for Australia ETSI.

LD 17 – Configure a PRI2 loop for the ETSI Australian ISDN connectivity.

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	CEQU	Make changes to Common Equipment parameters.
...		
- PRI2	0-159	PRI2 loop number.
...		

LD 17 – Configure the D-channel for ETSI Australian ISDN connectivity.

Prompt	Response	Description
REQ	CHG	CHG = Change existing data.
TYPE	ADAN	Action device and number.
- ADAN	NEW DCH xx	Add a D-channel on logical port 0-63 (Options 51C-81C).
	NEW DCH x	Add a D-channel on logical port 0-15 (Option 11C).
- CTYP		
	MSDL	Multi-purpose Serial Data Link card or Downloadable D-Channel Daughterboard (Options 51C-81C). Downloadable D-Channel Daughterboard (Option 11C).
- GRP	0-4	Network group number (Options 81C).
- DNUM	0-15	Device number for I/O ports (Options 51C-81C). All ports on the MSDL card share the same DNUM. The MSDL card address settings must match the DNUM value.
	1-10	The card number of the Downloadable D-Channel Daughterboard (Option 11C).

- PORT	0-3 1	Port number on the MSDL card (Options 81C). For Option 11C.
- DES	aaa...a	Designator. DES is used to identify the link and can be up to 16 alphanumeric characters: 0-9, and upper case A-Z. Characters “*” and “#” are not allowed.
- USR	PRI	This D-channel is used for Primary Rate only.
- IFC	EURO	EuroISDN interface.
- - CNTY	EAUS	Australia ETSI.
- - DCHL	0-159	PRI2 loop number for D-channel (Options 51C-81C).
	1-9	PRI2 loop number for D-channel (Option 11C).
- CNEG	(1) 2	Options for outgoing Channel Negotiation. Option 1: Channel is non-negotiable. Option 2: The Channel listed is preferred, but negotiable.
- RLS	xx	Software Release of the far-end switch.
- RCAP		Remote capabilities, prompted to configure the Connected Line ID Presentation supplementary service.
	(COLP) XCOL MCID XMCI	CLID Presentation supported. To remove COLP. Allow Malicious Call Trace Remove Malicious Call Trace.
- OVLS	YES	Allow Overlap Sending.
- - OVLT	(0)-8	Duration of time, in seconds, that the sending side has to wait between INFO messages are sent. “0” means send immediately
- TIMR	YES	Change programmable timers. Only supported for interfaces supporting one of the following timers.
- - T310	(30)-100	Maximum time in seconds between an incoming CALL PROCEEDING message and the next incoming message.

- - INC_T306	0-(2)-30	Variable timer, in seconds, for received DISCONNECT message on incoming calls allowing in-band tone to be heard. The network will stop sending after this timer times out. The value is stored in two-second increments, which are rounded up.
- - OUT_T306	0-(30)-240	Variable timer, in seconds, for received DISCONNECT message on outgoing calls allowing in-band tone to be heard. The network will stop sending after this timer times out. The value is stored in two-second increments, which are rounded up.
- LAPD	(NO) YES	(Do not) allow the changing of the layer 2 timer.
...		

LD 16 – Configure the ETSI Australian ISDN PRI2 Route Data Block.

Prompt	**Response**	**Description**
REQ	NEW CHG	Add new data. Change existing data.
TYPE	RDB	Route Data Block.
CUST	xx	Customer number. xx = 0-99 (Options 51C-81C). xx = 0-31 (Option 11C).
ROUT	0-511 0-127	Route number (Options 51C-81C). Route number (Option 11C)
TKTP	TIE COT DID	TIE trunk type. Central Office Trunk type. Direct Inward Dialing trunk type.
...		
DTRK	YES	Digital trunk route.
- DGTP	PRI2	2.0 Mb PRI digital trunk type.
...		

ISDN	YES	Integrated Services Digital Network.
- MODE	PRA	ISDN PRI route.
- IFC	EURO	EuroISDN interface.
- - CNTY	EAUS	Australia ETSI.
...		
MCTS	YES	Enable MCT signaling.
...		
- MCTM	(0)-30	Malicious Call Trace disconnect delay timer (this timer overrides the T306 timer for calls originating or terminating on sets with MCT Class of Service).
- MTND	(NO) YES	(Do not) apply a Malicious Call Trace disconnect delay for tandem calls.

LD 14 – Configure the Australia ETSI ISDN PRI2 trunks.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	TIE COT DID	TIE trunk data block. Central Office Trunk data block. Direct Inward Dialing trunk data block.
		Note: Must match TKTP defined in LD 16.
TN		Loop and channel for digital trunks (Options 51C-81C), where:
	l ch	Previously defined PRI2 loops. Channel 1-30
	c u	cu = card and unit (Option 11C).
CUST	xx	Customer number, as defined in LD 15. xx = 0-99 (Options 51C-81C). xx = 0-31 (Option 11C).
RTMB	0-511 1-510 0-127 1-510	Route number and member number (Options 51C-81C). Route number and member number (Option 11C).
TGAR	0 - (1) - 31	Trunk Group Access Restriction The default of 1 automatically blocks direct access.

LD 17 – Configure Advice of Charge for Australia ETSI.

Note: The MR/PPM package 101 must be equipped on the Meridian 1.

Prompt	Response	Description
REQ	CHG	CHG = Change existing data.
TYPE	PARM	Change system parameters,
...		
OCAC	(NO) YES	(Do not) support the Original Carrier Access Code format.
MTRO	PPM	Use Periodic Pulse Metering as the metering option. The default is MR, for Message Registration.
...		

LD 15 – Allow Charge Display and CDR Charge.

Prompt	Response	Description
REQ:	CHG	CHG = Change existing data.
TYPE:	PPM	Periodic Pulse Data.
OPT	CHDA	Charge Display Allowed.
...		
UCST	(0)-9999	Unit cost for PPM.
...		

LD 10 – Assign meters to analog (500/2500) sets.

Prompt	Response	Description
REQ:	NEW CHG	Add new data. Change existing data.
TYPE:	500	Analog set.

TN		TN address
	l s c u cu	Loop, shelf, card, and unit (Options 51C-81C). Card and unit (Option 11C).
...		

LD 11 – Assign meters to Meridian proprietary sets.

Prompt	Response	Description
REQ:	NEW CHG	Add new data. Change existing data.
TYPE:	aaa	Telephone set type.
TN		TN address
	l s c u cu	Loop, shelf, card, and unit (Options 51C-81C). Card and unit (Option 11C).
...		

LD 16 – Allow Advice of Charge on the route configured for Australia ETSI.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	RDB	Route Data Block.
CUST	xx	Customer number, as defined in LD 15. xx = 0-99 (Options 51C-81C). xx = 0-31 (Option 11C).
ROUT	0-511 0-127	Route number, as previously configured (Options 51C-81C). Route number, as previously configured (Option 11C).
TKTP	TIE COT DID	TIE trunk type. Central Office Trunk type. Direct Inward Dialing trunk type.
...		

DTRK	YES	Digital trunk route.
- DGTP	PRI2	2.0 Mb PRI digital trunk type.
...		
ISDN	YES	Integrated Services Digital Network.
- MODE	PRA	ISDN PRI route.
- IFC	EURO	EuroISDN interface.
- - CNTY	EAUS	Australia ETSI.
...		
CDR	YES	Include AOC information in the CDR ticket.
...		
- OAL	YES	CDR on all answered outgoing calls.
- - OTL	YES	CDR on all outgoing toll calls.
...		
MR	STAC DURC ENDC	Define AOC at call set-up. Define AOC during the call. Define AOC at end of call.
DSPD	(NO) YES	(Do not) display the charge during the call.
...		
RUCS	0-9999	Route unit cost.
RURC	X Y	Route unit reference cost. Formula is $X*10^{(-Y)}$ where X = 0-9999, Y = 0-3. The default value for X is the value that is entered for RUCS.

RUCF	1 0	Route unit conversion factor. 0 = No conversion is required.
DSPT	0-(10)-60	Charge display timer.
...		

Feature operation

No specific operating procedures are required to use this feature.

AXE-10 (Australia), non-Asia Pacific connectivity

Description

This feature allows ISDN PRI connectivity between the Meridian 1 and the AXE-10 for Australia, using switched-circuit mode connections. The design in based on the international 30B + D PRI configuration.

Basic ISDN PRI connectivity between the Meridian 1 and the AXE-10 will support:

- Basic call service
- Connected number delivery
- Calling Line Identification, both public and private
- Increased CDR accuracy
- COT, DID, DOD, and TIE call types
- 64 kb/s clear-bearer capability
- Channel Negotiation
- Overlap Sending (but not overlap receiving)
- Flexible Numbering Plan
- Advice of Charge at end of call

Operating parameters

The only connection that is supported is the switched circuit mode connection.

The supplementary service control messages not relating to a call are not supported.

The Meridian 1 does not send the High Layer Compatibility Information Element in the SETUP message to the AXE-10, nor does it send the Restart Request and Restart Global Call States.

Overlap Receiving is possible only if the AXE-10 conforms to the guidelines contained in CCITT's preliminary Q.931 section 5.0.

Feature interactions

There are no feature interactions specified for this feature.

Feature packaging

To support all of the call services, the following packages must be equipped:

- Digit Display (DDSP) package 19;
- Integrated Services Digital Network (ISDN) package 145;
- 2.0 Mb Primary Rate Interface (PRI2) package 154;
- Flexible Numbering Plan (FLEN) package 160;
- Overlap Signaling (OVLP) package 184; and
- International Primary Rate Access (IPRA) package 202.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 17 – Define system support for the AXE-10 Australia connectivity.

2 LD 16 – Configure the routes for the AXE-10 Australia connectivity.

The following procedures assume that a D-channel has been configured. Refer to the Data Administration chapter overlay procedures, page 830.

LD 17 – Define system support for the AXE-10 Australia connectivity.

Prompt	Response	Description
REQ	CHG	Change existing data block.
TYPE	CFN	Configuration record.
- ADAN	CHG DCH x	Change a D-channel on logical port 0-63 (all other machine types).
	CHG DCH x	Change a D-channel on logical port 0-15 (Option 11).
...		
- IFC	AXEA	Ericsson AXE-10 for Australia.
- CNEG	(1) 2	The required channel negotiation option, either exclusive (the default) or preferred.

LD 16 – Configure the routes for the AXE-10 Australia connectivity.

Prompt	Response	Description
REQ	NEW, CHG	New, or change.
TYPE	RDB	Route Data Block.
CUST	xx	Customer number associated with this route.
ROUT	xx	Route number.
...		
IFC	AXEA	Ericcson AXE-10 for Australia.

Feature operation

There are no operating procedures specified for this feature.

AXE-10 (Sweden), non-Asia Pacific connectivity

Description

This feature allows ISDN PRI connectivity between the Meridian 1 and the Ericsson AXE-10 for Sweden, using switched-circuit mode connections. The design in based on the international 30B + D PRI configuration.

Basic ISDN PRI connectivity between the Meridian 1 and the AXE-10 will support:

- Basic call service
- Connected number delivery
- Calling Line Identification, both public and private
- Increased CDR accuracy
- COT, DID, DOD, and TIE call types
- 64 kb/s clear-bearer capability
- Channel Negotiation
- Overlap Sending (but not overlap receiving)
- Flexible Numbering Plan
- Advice of Charge at end of call

Operating parameters

The only connection that is supported is the switched circuit mode connection.

The supplementary service control messages not relating to a call are not supported.

The Meridian 1 does not send the High Layer Compatibility Information Element in the SETUP message to the AXE-10, nor does it send the Restart Request and Restart Global Call States.

Overlap Receiving is possible only if the AXE-10 conforms to the guidelines contained in CCITT's preliminary Q.931 section 5.0.

Feature interactions

There are no feature interactions specified for this feature.

Feature packaging

To support all of the call services, the following packages must be equipped:

- Digit Display (DDSP) package 19;
- Integrated Services Digital Network (ISDN) package 145;
- 2.0 Mb Primary Rate Interface (PRI2) package 154;
- Flexible Numbering Plan (FLEN) package 160;
- Overlap Signaling (OVLP) package 184; and
- International Primary Rate Access (IPRA) package 202.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 17 – Define the system support for the AXE-10 Sweden connectivity.

2 LD 16 – Configure the routes for the AXE-10 Sweden connectivity.

The following procedures assume that a D-channel has been configured.

LD 17 – Define the system support for the AXE-10 Sweden connectivity.

Prompt	Response	Description
REQ	CHG	Change existing data block.
TYPE	CFN	Configuration record.
- ADAN	CHG DCH x	Change a D-channel on logical port 0-63 (all other machine types).
	CHG DCH x	Change a D-channel on logical port 0-15 (Option 11).
...		

- IFC	AXES	Ericsson AXE-10 for Sweden.
- CNEG	(1) 2	The required channel negotiation option, either exclusive (the default) or preferred.

LD 16 – Configure the routes for the AXE-10 Sweden connectivity.

Prompt	Response	Description
REQ	NEW CHG	New, or change.
TYPE	RDB	Route Data Block.
CUST	xx	Customer number associated with this route.
ROUT	xx	Route number.
...		
IFC	AXES	Ericcson AXE-10 for Sweden.

Feature operation

There are no operating procedures specified for this feature.

NEAX-61 (New Zealand), non-Asia Pacific connectivity

Description

This feature provides an ISDN Primary Rate Interface (PRI) between the Meridian 1 and New Zealand NEAX-61. The design in based on the international 30B + D PRI configuration.

Meridian 1 to New Zealand NEAX-61 ISDN PRI Connectivity supports the following:

- Basic Call Service
- Calling Line Identification (public and private)
- Overlap Sending
- COT, DID, DOD, and TIE trunk call types
- 64 kbps clear bearer capability

- Channel Negotiation
- nB+D, up to 120 B-channels/four interfaces
- Public Switched Telephone Network (PSTN) three-party conferencing
- Flexible Numbering Plan, and
- Malicious Call Trace.

Note that Electronic Switched Network (ESN) cannot be supported across the interface for private network applications. Coordinated Dialing Plan (CDP) and Network Automatic Route Selection/Basic Automatic Route Selection (NARS/BARS) can access the public network, but private network features are not supported. The NEAX-61 does not support the required numbering plans to allow CDP or UDP (location code dialing).

New Zealand Supplementary ISDN Services

Malicious Call Trace

This subscription supplementary service allows the Meridian 1 to inform the public network in New Zealand that the current call is malicious. The NEAX-61 automatically records all calls to a number subscribing to the MCT feature. If an MCT is activated, the public network marks the call as being malicious.

This service is activated by ISDN messaging. It is a user-triggered feature, requiring the called party to press a key or dial codes.

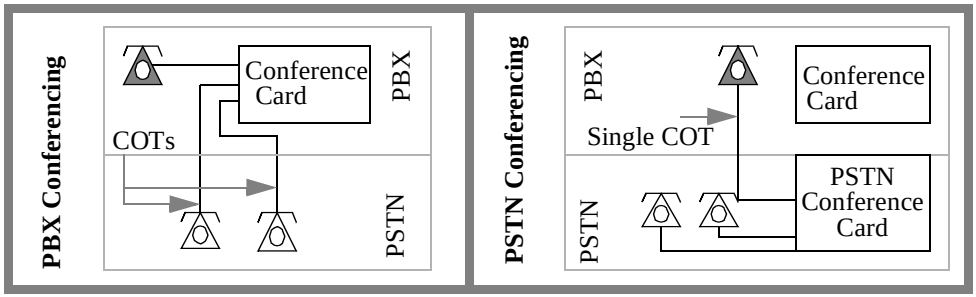
PSTN Three Party Conference

General

This subscription supplementary service allows the New Zealand NEAX-61 to provide a Three Party Conference. Rather than having the Meridian 1 provide the conference capability and the two trunks, it allows a caller to conference in two external callers using one trunk. This supplementary feature is activated using the Trunk Hook Flash (THF) or Centrex Switch Hook Flash operation, and is user invoked.

To illustrate this operation, the PBX supported conference and PSTN supported conference is illustrated in Figure 71.

Figure 71
PBX and PSTN supported conference



This operation is a stand-alone feature as the network wide trunk hook flash is not supported. Note also that from the New Zealand NEAX-61 side, MCT and PSTN conferencing are mutually exclusive features.

Call Detail Recording for PSTN Three Party Conferencing

PSTN Three Party Conferencing does not have the capability of providing precise Call Detail Recording (CDR) records. The NEAX-61 does not send messages to indicate that one of the two external parties has released, or that the attempt to complete the conference via THF was unsuccessful, due to the third party not being established. Therefore, if party “A” on the Meridian 1 called party “B” in the public network, and later called party “C”, no notice is given whether party “C” answered. As well, if either of “B” or “C” releases, the Meridian 1 will not be informed.

As a result, no attempt is made to make the CDR records match the normal “S” and “E” records of conference calls with two trunks. Instead of two “S” records at the start of the conference, a single “Y” record is issued to indicate a PSTN feature is invoked. This “Y” record includes all digits dialed to access the third party. The final record, produced on call clearing, remains as an “N” record, and includes information from the original call.

Operating parameters

The following hardware is used to implement the interface:

- For Options 51C through 81C and SL-1 systems, the layer one function is provided by the circuit pack NT8D72 (2.0 Mb PRI card for non Option 11 systems). Layer two and three are provided by the Multi-purpose Serial Data Link (MSDL – NT6D80) for these systems. The QPC775 Clock Controller will be used to provide clock synchronization.
- For Option 11C, the layer one function is provided by the Downloadable D-channel Primary Rate motherboard, circuit pack NTBK50AA. Layer two and three are provided by the Downloadable D-channel daughterboard, circuit pack NTBK51AA. The Clock Controller daughterboard NTAK20BB is used to provide clock synchronization.

Feature interactions

Calling Line Identification

This feature is provided via the Calling Party Number. It will have the following format when the Meridian 1 is connected to a NEAX-61:

ZZZZ + YYYY +DDDDDDD

The Customer Data block contains the prompts PFX1 and PFX2 for the responses “ZZZZ” and “YYYY” respectively. “DDDDDDD” is a Meridian 1 internal (set) DN up to seven digits. The prompts PFX1 and PFX2 must be defined by the technician so that the combination of PFX1, PFX2, and the originating DN provides a correct number for the terminating party to dial in order to reach the originating party. If no digits are configured for either of the prefixes, that part of the number will not be included in the Calling Party Number Information Element (IE).

Call Redirection (Call Forward, Hunt, CFNA) and Modification (Conference, Transfer)

All of the following actions apply to the call itself; a notice of redirection or modification (changes in CLID, etc.) is not transmitted. It is possible to Call Forward a set on a Meridian 1 to an external number over an NEAX-61 Primary Rate Interface (this operates exactly the same as over any other Central Office trunk).

A set on the Meridian 1 can Hunt or CFNA to an external number over an NEAX-61 Primary Rate Interface (this operates exactly the same as over any other Central Office trunk).

It is possible to transfer or conference a call on the Meridian 1 to an external number over an NEAX-61 Primary Rate Interface (this operates exactly the same as over any Central Office trunk). Access restrictions may block some transfers from being completed, but this is consistent with other interfaces.

Outpulsing of Asterisk "*" and Octothorpe "#" (OPAO)

As the outpulsed digits can include the octothorpe "#" and asterisk "*", this feature is used to provide the function. The impact on other applications of OPAO is negligible.

Centrex Switchhook Flash

The Centrex Switchhook Flash feature provides an analog trunk line break to initiate public network features. This capability is expanded to include ISDN signaling to the New Zealand NEAX-61. As the ISDN equivalent is carried out by D-channel signaling, only the triggering of the flash by a set is shared with the analog Centrex flash; signaling via ISDN messaging is independent.

Feature interactions Interworking within the Meridian Customer Defined Network

The following group of features are supported in part by Meridian 1 to New Zealand NEAX-61 ISDN PRI Connectivity. These cannot be supported across the NEAX-61 interface, but will interwork with a call coming in from the PSTN. The portion of the function local to the Meridian Customer Defined Network (MCDN) is supported there.

BRI Sets

The NEAX-61 interface will support calls from BRI sets within the MCDN. These will be able to call out to and receive calls from the Public Switched Telephone Network (PSTN). Operation will be as though the call was a tandem trunk call, with all IEs supported on the interface passed transparently.

BRI Trunks

BRI trunks are supported by the NEAX-61 interface.

Calling Party Name Display

This feature is offered within the MCDN. Names can be assigned to various items, including route access codes. An incoming call across this route will have the name stored against the route displayed. This will continue, however, CPND received from the NEAX-61 is not currently supported, and sending CPND to the NEAX-61 is also not supported at this time.

Calling Line Identification (CLID) Enhancements

MCDN Component CLID enhancements for a redirected call will be seen within the MCDN part of the call. If an incoming PSTN call is redirected, this will be displayed on the terminating device as applicable. If a call is redirected off the MCDN, information up to and including the redirection off of the network will be provided. This feature cannot be offered across the NEAX-61 interface as it depends on an IE not supported by the NEAX-61 (the Redirecting Number IE).

DPNSS Gateway

The NEAX-61 interface interacts with the DPNSS gateway consistently as with other PSTN interfaces. The IEs supported on the NEAX-61 interface which have equivalents in DPNSS interwork on an IE-by-IE basis. IEs that have no matching DPNSS element are discarded. Supported IEs with DPNSS equivalents pass through with appropriate mapping.

Coordinated Dialing Plan (CDP)

A CDP call can access the trunk. However, since neither the private plan nor the CDP numbering type is supported by the NEAX-61, these get converted to unknown type and plan. This applies to both the called and calling number plan and type.

Since the normal use of CDP does not provide a number that can be dialed when calling the public network, the NEAX-61 will replace the CLID with the default number for the system. Normal use of steering codes with Distant Steering Codes (DSCs) and Trunk Steering Codes (TSCs) will be maintained. Use of a Digital Manipulation Index (DMI) to convert the number as required can be done.

Basic Automatic Route Selection (BARS)

This feature has no interactions with the NEAX-61 with the exceptions of: the NPA and NXX cannot be used on this interface, as the public network cannot accept them; and SPNs get converted to “unknown numbering plan and type, as the ESN SPN is a North American concept.

Network Automatic Route Selection (NARS)

All BARS concerns exist for NARS as well. In addition, location codes should be used with care, since the networking features do not accept a Digit Manipulation Index (DMI) used to insert an ESN access code. Therefore, the only supported usage has the trunks effectively treated as though they were non-ISDN.

Network Attendant Service (NAS)

NAS is not supported across the interface except in a few simple ways. An incoming call from the NEAX-61 can be routed using NAS. NAS routing will allow a call to the attendants in night service to be rerouted across the NEAX-61, but no NAS function is possible. The call will be treated as though the call was placed directly, rather than via NAS. Thus, NAS attendant control, signaling, and recall and so forth are not possible.

Network Call Redirection, Network Call Forward, Network Call Forward No Answer – MCDN Component

These features cannot be offered to the NEAX-61 or across its interface. However, they are offered within the MCDN network, and the aspects applicable within the network still apply.

If an incoming call from the NEAX-61 is MCDN call redirected, all signaling information within the Meridian 1 network will be consistent with current operations, but redirection information will be discarded at the Meridian 1 to NEAX-61 interface. If a call originating within the MCDN is redirected to the PSTN, all redirection information up to and including the redirection to the public network will be provided through the network.

Trunk Optimization – MCDN Component

Trunk Optimization within the MCDN will be supported by the appropriate interfaces. It will not be supported across the NEAX-61 interface, but will interwork transparently. In other words, trunk optimization will not be observed at the NEAX-61 interface; the call will appear to be static, not undergoing any modifications.

Virtual Network Services (VNS)

VNS uses a dedicated, MCDN level of service DCH to control a number of temporary B-channels, seized and used on demand. The ISDN signaling requests a connection (SETUP), and a returned FACILITY has a DN that is to be recognized as a VNS virtual DN on the terminating switch. On this VNS DN being received, the original call is completed, since a B-channel has now been obtained.

An NEAX-61 trunk can act as a virtual B-channel.

Feature packaging

There is no new software package for this feature.

The following packages are required for customers who choose to have software that allows them to connect the Meridian 1 over ISDN PRI to the NEAX-61 (New Zealand) interface:

- Digit Display (DDSP) package 19 for Calling Line Identification on ISDN PRI;
- Outpulsing of Asterisk “*” and Octothorpe “#” (OPAO) package 104;
- Integrated Services Digital Network (ISDN) package 145;
- 2.0 Mb Primary Rate Access (PRI2) package 154;
- International Primary Rate Access (IPRA) package 202; and
- New Format Call Detail Recording (FCDR) package 234.

To carry out overlap sending to the PSTN, the following packages and their prerequisites are required:

- Overlap Signalling (OVLP) package 184; and
- One or more of:
  - Basic Alternate Route Selection (BARS) package 57;
  - Network Alternate Route Selection (NARS) package 58; or
  - Coordinated Dialing Plan (CDP) package 59.

If the user subscribes to the following services on the PSTN, the ISDN International Supplementary (ISDNS) package 161 is required. The packages as listed below for each feature are also required:

- **Malicious Call Trace (MCT)** – the Malicious Call Trace (MCT) package 107.
- **PRA Groups (nB+D)** – the International nB+D (INBD) package 255.
- **PSTN Three Party Conferencing** – the Trunk Hook Flash (Centrex) (THF) package 157. For FFC access to this feature, the Flexible Feature Codes (FFC) package 139, Controlled Class of Service (CCOS) package 81, and International Supplementary Services (SUPP) package 131 are required.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1. LD 17 – Configure an ISDN interface supporting the Telecom New Zealand ISDN protocol.
2. LD 16 – Configure a COT, DID/DOD, or TIE route using the Telecom New Zealand (TCNZ) protocol.

LD 17 – Configure an ISDN interface supporting the Telecom New Zealand ISDN protocol.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	CFN	Configuration data block.
- ADAN	CHG DCH x	Change a D-channel on logical port 0-63 (all other machine types).
	CHG DCH x	Change a D-channel on logical port 0-15 (Option 11).
- CTYP	MSDL	TCNZ requires the D-channel be defined on an MSDL.
- DNUM	0-15	Device number on MSDL card for all systems, except the Option 11.
- PORT	0-3	Port number on the MSDL.

- GRP	0-4	Network group number for the Option 81C.
CDNO	1-10	Card number on the Option 11.
- DES	aaaaaa	Alphanumeric designator.
- DPNS	(NO) YES	Digital Private Network Signaling.
- USR	PRI	D-channel mode.This D-channel is used for Primary Rate only.
- IFC	TCNZ	Telecom New Zealand.
-DCHL	0-159 (0)-3	TCNZ loop and interface ID – non Option 11.
	1-10 (0)-3	TCNZ loop and interface ID – Option 11.
- PRI2	0-159 0-3	Secondary PRI2 loops for nB+D, plus sequence. Note that the D-channel is not necessarily on IFC ID 0; this is set by service change.
- OTBF	1-(32)-127	Number of output request buffers.
- CNEG	(1) 2	Options for outgoing Channel Negotiation. Option 1: Channel is non-negotiable. Option 2: The Channel listed is preferred, but negotiable.
- RCAP	aaa	Remote DCH capabilities, as applicable.
- OVLS	YES	Allow overlap sending.
- - OVLT	1-8, 0	Time the sending side has to wait between INFO messages. “0” means send immediately.
- TIMR	(NO) YES	Change protocol timer value.
- - T310	10-60	Timer used to determine how long the switch can wait for the response message when the QSIG outgoing call is in the outgoing call processing state.

- - INC_T306	0,(2),...,T306 (T306 is the duration of the T306 Network timer in seconds)	Variable timer for received DISCONNECT message on incoming calls, allowing in-band tone to be heard when sent by the network. The network will stop sending tone after T306 expires, so the maximum time will be T306. Entered in two-second increments. TCNZ interface: T306 = 30 sec.
- - OUT_T306	0,2,...,(T306) (T306 is the duration of the T306 Network timer in seconds)	Variable timer for received DISCONNECT message on outgoing calls, allowing in-band tone to be heard when sent by the network. The network will stop sending tone after T306 expires, so the maximum time will be T306. Entered in two-second increments. TCNZ interface: T306 = 30 sec.
- LAPD	(NO) YES	Change the Link Access Protocol for D-channel parameters.

LD 16 – Configure a COT, DID/DOD, or TIE route using the Telecom New Zealand (TCNZ) protocol.

Prompt	Response	Description
REQ	NEW, CHG	New, or change.
TYPE	RDB	Route Data Block.
CUST	xx	Customer number.
ROUT	xx	Route number.
...		
DGTP	PRI2	Type of digital route.
ISDN	YES	Default for a PR!2 route.
MODE	PRA	Primary Rate Access.
...		
IFC	TCNZ	Telecom New Zealand (NEAX-61).

...		
CTYP	UKWN, INTL, NPA, NXX	Only these call types are supported for TCNZ interface TIE routes.
...		
OPD	(YES) NO	Outpulsed digits in CDR.
CDRX	YES NO	X records produced on call transfer.
NDP	INC 1-32 EXC 1-32	Number of printed digits; output the first 1-32 digits. Suppress the last 1-32 digits. If REQ = NEW, output all digits and suppress none, if REQ = CHG, leave unchanged.
CDRY	(NO) YES	CDR Public Network Feature Invoke records will (will not) be generated when the feature is invoked. Default is NO.
OPA	(NO) YES	Generate CDR records for PPM pulses.
...		
MCTS	(NO) YES	Send a Malicious Call Trace request to the public network if MCT is invoked in the private network on current switch.

Feature operation

There are no operating procedures specified for this feature.

Numeris VN3 (France)

Description

This feature provides ISDN PRI connectivity between the Meridian 1 software and the ISDN access software developed by France Telecom (Numeris). The connectivity is based on International 30B+D ISDN Primary Rate Access development.

The following basic services are provided for this initial offering of the ISDN PRI Meridian 1 to Numeris connectivity:

- Basic Call Service
- Calling Line Identification (public and private)
- Confidentiality of Calling Line Identification

- COT, DID, DOD, TIE trunks call types
- 64 kbps clear bearer capability
- Channel Negotiation
- Call Restriction
- Flexible Numbering Plan
- Advice of Charge at end of call, and during call

Operating parameters

The only connection that is supported is the switched circuit mode connection. The X.25 packet mode connection, via the B-channel, the packet mode temporary signaling connection, and the semi-permanent circuit-mode connection are not supported.

The NUMERIS supplementary service control messages not relating to a call are not supported.

The Calling Party Number Information Element may have two occurrences, with two different contents, in a SETUP message sent from the network to the user. For CLID display processing, the Meridian 1 interprets only the contents of the first Calling Number Information Element.

For direct trunk access code dialing, digit analysis is not performed for the enbloc dialing. A time-out rather than an "#" is used as an indication that dialing has been completed.

Overlap Receiving has not been implemented for NUMERIS.

The maximum delay to send an RAI signal upon detection of an LOS, LFAS, LMAS, and AIS is 100 milliseconds. The same applies to the termination of RAI transmission when the alarm condition clears up.

No incoming/outgoing calls can be initiated during an RAI, LFAS, LMAS, AIS, LOS, or ERR alarm condition.

Incoming/outgoing calls must be allowed within 100 milliseconds of cessation of an RAI, AIS, LOS, LMAS, or LFAS alarm condition.

Established calls must not be disconnected by layer 1 processing during an RAI, AIS, LOS, LMAS, LFAS, or ERR alarm condition.

An RAI signal must be sent if an ERR condition of 10^{-3} lasts more than four to five seconds.

The RAI transmission must cease after an ERR condition of 10^{-4} lasts for more than four to five seconds.

The PRI2 link must not be placed in Out-of-service condition due to an RAI, LFAS, LMAS, AIS, LOS, or ERR alarm condition.

If the PRI2 pack is manually disabled, it must go into the Out-of-service state.

Feature interactions

There are no feature interactions specified for this feature.

Feature packaging

To support all of the call services, the following packages must be equipped:

- Digit Display (DDSP) package 19 (required for CLID);
- Integrated Services Digital Network (ISDN) package 145;
- 2.0 Mb Primary Rate Interface (PRI2) package 154; and
- International Primary Rate Access (IPRA) package 202.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 17 – Define system support for NUMERIS.

2 LD 16 – Configure routes for NUMERIS.

3 LD 73 – Define the alarm handler in the firmware, disable or enable the grade of service processing in the software, and define the number of seconds before the firmware sends an ERR message.

The following procedures assume that a D-channel has been configured.

LD 17 – Define system support for NUMERIS.

Prompt	Response	Description
REQ	CHG	Change existing data block.
TYPE	CFN	Configuration record.
- ADAN	CHG DCH x	Change a D-channel on logical port 0-63 (all other machine types).
	CHG DCH x	Change a D-channel on logical port 0-15 (Option 11).
...		
- IFC	NUME	Numeris for France.
- CNEG	(1) 2	The required channel negotiation option, either exclusive (the default) or preferred.

LD 16 – Configure routes for NUMERIS.

Prompt	Response	Description
REQ	NEW, CHG	New, or change
TYPE	RDB	Route Data Block.
CUST	xx	Customer number associated with this route
ROUT	xx	Route number.
...		
IFC	NUME	Numeris for France

LD 73 – Define the alarm handler in the firmware, disable or enable the grade of service processing in the software, and define the number of seconds before the firmware sends an ERR message.

Prompt	Response	Description
REQ	NEW, CHG	New, or change.
TYPE	PRI2	2.0 Mb Primary Rate Interface data block.
...		
ALRM	REG ALT	Regular firmware alarm handler (RAI transmission is controlled by software). Alternate firmware alarm handler (Immediate transmission of RAI by firmware).
...		
NOOS	 (NO) YES	Grade of service feat. Enables current grade of service feat. Alternate grade of service feat.
...		
RATS	1-(10)-15	The number of consecutive seconds the firmware has to check and validate error rate condition.

Feature operation

There are no operating procedures specified for this feature.

SwissNet 2 (Switzerland)

Description

This feature provides basic ISDN PRI connectivity between the Meridian 1 and a Central Office meeting SwissNet 2 specifications in Switzerland.

Following is the set of call services provided in the initial ISDN PRI offering for the Meridian 1 to SwissNet basic connectivity:

- Basic Call Service (3.1kHz, speech)
- Calling Line Identification (CLID) and Calling Line Restriction (CLIR)

- COT, DID, DOD, TIE call types
- 64 kbps clear bearer capability
- Channel Negotiation
- Flexible Numbering Plan
- Overlap Sending
- Advice of Charge during call

Operating parameters

The only connection that is supported is the switched circuit mode connection. The X.25 packet mode connection, via the B-channel, the packet mode temporary signaling connection, and the semi-permanent circuit-mode connection are not supported.

For Channel Negotiation to operate correctly, customers on the Meridian 1 cannot share a PRI to the SwissNet interface.

For Calling Line Identification to work correctly across a network, the nodes should be connected using a Coordinated Dialing Plan, with DNs of the same fixed lengths on each node.

Overlap Receiving has not been implemented for the SwissNet interface.

ISDN PRA to SwissNet Connectivity is not supported on DPNSS1.

Feature interactions

Calling Line Identification

The CLID will have the following format for Meridian 1 ISDN PRA to SwissNet Connectivity: zzzz+yyyy+ddddddd where zzzz and yyyy are entered in response to prompts PFX1 and PFX2 respectively, in LD 15, and ddddddd is an internal DN up to seven digits long. If no digits are configured for either PFX1 and PFX2, then the Calling Party Number IE will not contain the entire CLID number.

Call Detail Recording (CDR)

For calls made over an ISDN PRI to SwissNet interface equipped with the Advice of Charge at End of Call feature, all Start and Transfer records will show “OVF99” in the overflow count field. This is done to indicate that there will be charge units to be shared among successive call controllers at the end of a call.

Virtual Network Services (VNS)

VNS is supported over an ISDN PRI to SwissNet interface.

Feature packaging

To support all of the call services, the following packages must be equipped:

- Call Detail Recording, Teletype Terminal (CTY) package 5;
- Digit Display (DDSP) package 19 (required for CLID);
- PPM/Message Registration (MR) package 101;
- International Supplementary Features (SUPP) package 131;
- Integrated Services Digital Network (ISDN) package 145;
- 2.0 Mb Primary Rate Interface (PRI2) package 154;
- ISDN Supplementary Features (ISDNS) package 161;
- International Primary Rate Access (IPRA) package 202; and
- Multi-purpose Serial Data Link (MSDL) package 222 (if required).

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 17 – Define the ISDN PRI to SwissNet connectivity.

2 LD 16 – Define the ISDN PRI to SwissNet connectivity.

The following procedures assume that a D-channel has been configured.

LD 17 – Define the ISDN PRI to SwissNet connectivity.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	CFN	Configuration Record.
- ADAN	CHG DCH x	Change a D-channel on logical port 0-63 (all other machine types).
	CHG DCH x	Change a D-channel on logical port 0-15 (Option 11).
...	...	...
- IFC	SWIS	Interface type for SwissNet connectivity.
- CNEG	(1) 2	The required channel negotiation option, either exclusive (the default) or preferred.

LD 16 – Define the ISDN PRI to SwissNet connectivity.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	RBD	Route Data Block.
CUST	xx	Customer number.
ROUT	xx	Route number.
...	...	...
IFC	SWIS	Interface type for SwissNet connectivity.

Feature operation

There are no operating procedures specified for this feature.

SYS-12 (Norway)

Description

This feature allows ISDN PRI connectivity between the Meridian 1 and the Norwegian SYS-12, using switched-circuit mode connections. The ISDN PRI connectivity between the Meridian 1 and the SYS-12 supports:

- Basic call service
- Connected number delivery
- Calling Line Identification, both public and private
- Increased CDR accuracy
- COT, DID, DOD, and TIE call types
- 64 kb/s clear-bearer capability
- Channel Negotiation
- overlap sending (but not overlap receiving)
- Flexible Numbering Plan

Operating parameters

There are no operating parameters specified for this feature.

Feature interactions

There are no feature interactions specified for this feature.

Feature packaging

To support all of the call services, the following packages must be equipped:

- Periodic Pulse Metering/Message Registration (MR) package 101.

For PRI connectivity, the following packages are required:

- Integrated Service Digital Network (ISDN) package 145;
- 2.0 Mb Primary Rate Access (PRI2) package 154;
- ISDN Supplementary Features (ISDNS) package 161; and
- International Primary Rate Access (IPRA) package 202.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 17 – Define the ISDN PRI to SYS-12 connectivity.

2 LD 16 – Define the ISDN PRI to SYS-12 connectivity.

The following procedures assume that a D-channel has been configured.

LD 17 – Define the ISDN PRI to SYS-12 connectivity.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	CFN	Type of data block.
- ADAN	CHG DCH x	Change a D-channel on logical port 0-63 (all other machine types).
	CHG DCH x	Change a D-channel on logical port 0-15 (Option 11).
...	...	...
- IFC	SS12	Interface type for SYS-12 connectivity.
- CNEG	(1) 2	The required channel negotiation option, either exclusive (the default) or preferred.

LD 16 – Define the ISDN PRI to SYS-12 connectivity.

Prompt	Response	Description
REQ	NEW, CHG	New, or change.
TYPE	RDB	Route Data Block.
CUST	xx	Customer number.
ROUT	xx	Route number.
...	...	...
IFC	SS12	Interface type for SYS-12 connectivity.

Feature operation

There are no operating procedures specified for this feature.

1TR6 (Germany)

Description

This feature will allow the interconnection of the Meridian 1 with the 1TR6 protocol. Basic connectivity between the Meridian 1 and the 1TR6 DCH supports:

- Basic call service
- Connected number delivery
- Calling Line Identification, both public and private
- Increased CDR accuracy
- COT, DID, DOD, and TIE call types
- 64 kb/s clear-bearer capability
- Channel Negotiation
- Overlap sending (but not overlap receiving)
- Flexible Numbering Plan
- Advice of Charge at end of call
- Call restrictions to tandem calls

Operating parameters

There are no operating parameters specified for this feature.

Feature interactions

There are no feature interactions specified for this feature.

Feature packaging

To support all of the call services, the following packages must be equipped:

- Periodic Pulse Metering/Message Registration (MR) package 101.

For PRI connectivity the following packages are required:

- Integrated Service Digital Network (ISDN) package 145;

- 2.0 Mb Primary Rate Access (PRI2) package 154;
- ISDN Supplementary Features (ISDNS) package 161; and
- International Primary Rate Access (IPRA) package 202.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 17 – Define the ISDN PRI to 1TR6 connectivity.

2 LD 16 – Define the ISDN PRI to 1TR6 connectivity.

The following procedures assume that a D-channel has been configured.

LD 17 – Define the ISDN PRI to 1TR6 connectivity.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	CFN	Configuration record.
- ADAN	CHG DCH xx	Change a D-channel on logical port 0-63 (all other machine types).
	CHG DCH xx	Change a D-channel on logical port 0-15 (Option 11).
...	...	...
- IFC	1TR6	Interface type for 1TR6 connectivity.
- CNEG	(1) 2	The required channel negotiation option, either exclusive (the default) or preferred.

LD 16 – Define the ISDN PRI to 1TR6 connectivity.

Prompt	Response	Description
REQ	NEW CHG	New, or change.
TYPE	RDB	Route Data Block.
CUST	xx	Customer number.
ROUT	xx	Route number.
...	...	...
IFC	1TR6	Interface type for 1TR6 connectivity.

Feature operation

There are no operating procedures specified for this feature.

EuroISDN

Description

The original offering of the EuroISDN feature provided ISDN PRI connectivity between the Meridian 1 and Public Exchanges that comply to the European Telecom Standards Institute (ETSI) specification ETS 300 102 for the Layer 3. The interfaces provided by this feature also comply with the country-specific Application Documents for Austria, Denmark, Finland, Germany, Holland, Ireland, Italy, Norway, Portugal, Sweden, and Switzerland; other countries must comply with ETS 300 102.

The following capabilities were introduced for the Meridian 1 to EuroISDN connectivity:

- Basic call service
- Connected number delivery
- 64 kb/s clear-bearer capability
- Calling Line Identification Presentation,
- Calling Line Identification Restriction, Connected Line Identification Presentation and

- Connected Line Identification Restriction are provided for the above countries where Application Documents are available.
- Channel negotiation
- Advice of Charge (at call set-up, during call, and end of call) is supported in some countries
- interworking with other ISDN or non-ISDN interfaces, including MCDN, QSIG, R2 Multifrequency Compelled Signaling (R2 MFC), 2.0 Mb Digital Trunk Interface (DTI2), DPNSS1 and DASS2 links, ETSI-NET3 compliant BRI sets, and analog trunk interfaces.

The **EuroISDN Continuation** feature expanded the scope of the original EuroISDN feature to include application support for Switzerland, Spain, Belgium and the United Kingdom.

In addition, the following functionalities are provided by the EuroISDN Continuation feature:

- Intercept treatment upon reception of an invalid or incomplete called party number;
- Interception to an attendant for EuroISDN voice calls terminating on a data device;
- The capability to listen to tones and announcements provided by the Central Office on call clearing (T306 supported);
- The capability of transferring outgoing EuroISDN calls after completion of dialing (only for Italy);
- Calling Line Identification and Connected Line Identification transparency to or from EuroISDN to or from a Basic Rate Interface (BRI) set;
- The configuration of Connected Line Presentation (COLP) on a per D-channel basis (remote capability);
- 3.1 KHz audio bearer capability for outgoing fax calls, based on a Class of Service assigned to the Analog (500/2500 type) telephone;
- The capability of defining the bearer as “Voice” or “3.1 KHz” on a system basis;

- The addition and display of national or international prefix in front of the received Calling/Connected Line Identification on incoming/outgoing EuroISDN calls;
- Flexible national and local prefixes in addition to the Calling/Connected Line Identification on incoming/outgoing calls based on the route configuration;
- User-to-User information transparency in call control messages;
- Capability of mapping a PROGRESS message or Progress Indicator in a CALL PROCEEDING message into an ALERT or a CONNECT message on a per configuration basis;
- Capability of using different options to build the Calling Line Identification (CLID); and
- Called party number size increase to 31 octets.

This development also provides a subset of the ETSI Generic functional protocol for the support of supplementary services. Implementation relies on the Generic Functional (GF) Transport platform introduced in the ISDN QSIG GF Transport feature. The ETSI GF subset provides two types of supplementary service control entities as follows:

- **Bearer-related transport with a point-to-point transport mechanism**
  This service is used to transport supplementary service protocol information in association with a basic call.
- **Bearer-independent transport with a point-to-point (connection-oriented) mechanism**
  This service is used to transport supplementary service protocol information, which is entirely independent of any existing basic call.

The ETSI GF provides a generic transport platform that supports ETSI-compliant supplementary services. The ETSI GF protocol is implemented on the ETSI, Swiss, German and Danish EuroISDN interfaces.

EuroISDN Continuation Phase III added France, Russia and the Ukraine to the list of countries having country-specific Application Documents compliance for EuroISDN.

In addition to providing all of the functionalities provided by the original introduction of EuroISDN and the EuroISDN Continuation, EuroISDN Continuation Phase III introduces the following new functionalities for all EuroISDN interfaces:

- optional sending of last forwarding DN as CLID
- Trunk Route Optimization - before Answer applied to incoming EuroISDN trunks
- Numbering Plan Identification (NPI) and Type of Number (TON) included in CDR tickets for EuroISDN calls

The **EuroISDN ETS 300 403 Compliance Update** feature has been introduced to provide ISDN Primary Rate Interface and Basic Rate Interface to Central Offices that comply with the ETS 300 403-1 European Telecom Standards Institute (ETSI) standard.

Note: In order to support countries that have not yet upgraded to the ETS 300 403 standard, the Meridian 1 still interworks with Central Offices conforming to the ETS 300 102 standard. So, when programming the D-Channel for PRI2 trunks (in LD 17) or a PRI2 route for ISDN trunks (in LD 16) for an ETS 300 403 interface, the following applies:

- If IFC = E403 and CNTY = ETSI (ETS 300 403 for the user side) or NET (ETS 300 403 for the network side), then the interface is fully compliant with ETS 300 403.
- If IFC = E403 and CNTY = any of the supported country entries except ETSI and NET, then the interface behaves like an ETS 300 102 extended version, that is, in addition to the existing ETS 300 102 capabilities, the bearer capability and High Layer Compatibility selection procedures (fall-back mechanism), and the basic telecommunication service identification are also implemented in order to take advantage of new teleservices being offered, such as 7kHz telephony and Videotelephony.

  Also note that a user may still configure an interface fully compliant with the ETS 300 102 standard if IFC = EURO and CNTY = any of the supported country values.

With the EuroISDN ETS 300 403 Compliance Update feature, all of the functionalities provided by the previous offerings of the EuroISDN features are supported, along with the following enhancements:

- Support for signalling procedures for bearer capability and High Layer Capability selections by, providing repeatable Bearer capability, High layer compatibility Information Elements (IEs) in the SETUP message. ALERT, CALL PROCEEDING, CONNECT, and PROGRESS messages can be used to confirm the selected Bearer Capability/High Layer compatibility for the called user.

  This enhancement provides high-quality bearer services or teleservices, with alternate bearer capability or high layer compatibility in case of fall-back.

- Support for Basic telecommunication service identification. Each basic telecommunication service has the required Bearer capability IE encoding and, if applicable, the required High Layer compatibility IE encoding defined for that service. The requested teleservice is identified by taking the presented Bearer capability and High layer compatibility information elements in all combinations. If there is no valid combination, the presented Bearer Capability IE is considered in order to identify a bearer service.

Operating parameters

The EuroISDN feature does not support non-Downloadable D-Channel cards (an NT6D80 MSDL or NTBK51AA Downloadable D-Channel card is required on Options 51C, 61C, 81C, and the NTBK51BA Downloadable D-Channel card is required on the Option 11C).

Interworking with KD3 signaling is not supported.

Integrated Service Access (ISA) is not supported.

Advice of Charge for EuroISDN calls is supported with the Advice of Charge for EuroISDN feature.

The EuroISDN to CIS MF Shuttle gateway is supported, as provided by the CIS MF Shuttle feature.

The Auto Terminate Call feature is not supported.

The Call Back Queuing and Off-hook Queuing feature and the Flexible Hotline feature are not supported with Overlap Signaling.

End-to-End Signaling is supported on all outgoing EuroISDN routes as soon as the CALL PROCEEDING message with a Progress Indicator is received.

Special dial tones after dialed numbers are not supported for incoming calls.

For Connected Line Identification Presentation (COLP) supplementary service, sending or restricting connected line identification is not supported on a per call basis on non-ISDN BRI sets.

For the Optional Sending of Last Forwarding DN as CLID functionality, if more than one ACD redirection takes place when an ACD set is involved, the DN of the called set is sent as the CLID rather than the DN of the last forwarding set.

The EuroISDN feature does not support non-Downloadable D-Channel cards (an NT6D80 MSDL or NTBK51AA Downloadable D-Channel card is required on Options 51C, 61C, 81C, and the NTBK51BA Downloadable D-Channel card is required on the Option 11C).

Operating parameters pertaining to Call Control Procedures:

- If more than one Channel Identification IE is received in a SETUP message, only the first one is used by the Meridian 1. If it is not available, the call is processed as per the channel negotiation configuration. The call is released if no negotiation is allowed. The transfer of a unanswered EuroISDN call to a remote ringing set requires disconnect supervision on the TIE trunk. If the disconnect supervision is not available, after the external user hangs up, the trunk could be locked out. It is the craftsman's responsibility to ensure that the trunks used for this type of call actually have disconnect supervision.

Operating parameters pertaining to ETS 300 102:

- The user-to-user compatibility checking, by the means of the Low Layer compatibility IE and/or the High Layer compatibility IE, is not supported. The LLC IE and the HLC IE are tandemed by the Meridian 1, but this information is not used to perform any checking on a Meridian 1 node.

- Transit network selection is not supported. This IE is normally used by the user to identify a selected transit network in the SET-UP message. As no European country specifies the coding to use this IE, this service is not supported by the Meridian 1. As a result, this IE is never sent by the Meridian1.
- Extension for symmetric call operation is not supported. This is normally used to implement a private network application.
- Network specific facility selection procedures are not supported.
- D-Channel backup procedures are not supported by EuroISDN.
- Message segmentation procedures are not supported. These are normally used to split messages that are too long.
- Low Layer Information coding principle is not checked by the Meridian 1. No LLC is generated by the Meridian 1, but this information is tandemed if received (from an ISDN BRI set for example).
- Low layer compatibility negotiation procedures are not supported.
- The USER INFORMATION message is not implemented in the Meridian 1 software.

Operating parameters pertaining to ETSI GF:

- ETSI GF gateways to and from other signalling systems, such as DPNSS1, QSIG, and MCDN, are not supported.
- The following ETSI GF procedures are not implemented:
  - control of supplementary services using the separate message approach (HOLD/RETRIEVE).
  - bearer-related broadcast transport mechanism (multipoint configuration).
  - bearer-independent point-to-point connectionless transport mechanism.
  - bearer-independent broadcast transport mechanism.
  - generic notification procedures.
  - network-side channel reservation function.
  - generic procedures for supplementary service management.

— generic status request procedure.

— support of the Extended facility information element.

- DN address translation requires the association with a customer number. For an ETSI basic call establishment, the customer number association is found through the B-Channel identified in the channel ID IE. For DN address translation that is not associated with a basic call, the customer number association needs to be determined through other methods.

  For a BRI trunk DSL interface, there is a customer number association with the D-Channel. For a PRI interface, a prompt is added for an ETSI D-Channel configuration to create a customer number association with a given D-Channel. This implies that bearer independent messages on a primary rate D-Channel are associated with a single customer as configured in overlay 17. For example, in a multi-customer configuration, if every customer on the switch wishes to use the bearer-independent transport service over ETSI PRI interfaces, then each customer requires a separate D-Channel.

- The Facility Information Element (FIE) is a repeatable IE, and its length is application dependent. However, due to system capacity considerations, such as call register usage and real time usage, there are two types of limitations enforced by the ETSI GF transport platform (actually by the ISDN GF transport platform provided by the ISDN QSIG GF development):

  — the Meridian 1 ETSI GF platform supports up to a maximum of eight ROSE components in one message.The eight components may be included in one Facility Information Element (FIE), or multiple FIEs. In addition, the inclusion of components in a message is also limited by the “available message length”. The available message length is the difference between the maximum message length (260 octets), and the maximum message length taken up by other mandatory and optional IEs supported in the given message.

  — when a supplementary service requests the ISDN ETSI GF transport to send a component which exceed the available message length or the number of components supported, the supplementary service will be notified.

Operating parameters pertaining to ETS 300 403:

- The operating parameters pertaining to ETS 300 102 are applicable to ETS 300 403, except for the user-to-user compatibility checking, which is partially supported in some cases. For instance, as in the case of the EuroISDN 7 kHz/Videotelephony teleservices.
- Codeset 4, which is reserved for use by the ISO/IEC standards, has been added to the ETS 300 403 standard. This codeset is currently not used by the Meridian 1. Therefore, it is not supported.
- The fall-back capability for multirate services is not supported.

Feature interactions

Call Completion Supplementary Service

Call Completion interacts with Call Transfer Over EuroISDN SN3. Call Completion Free Notification can only be presented to the Call Completion originating station and cannot be transferred to any other station. However, once the Call Completion call is established, it behaves as a normal call with respect to Call Transfer.

Call Detail Recording

The Optional Sending of Last Forwarding DN as CLID functionality interacts with the CDR feature. The CLID field in the CDR ticket for the redirected outgoing EuroISDN call is modified according to the CLID information in the SETUP message.

CLID Enhancements

The Optional Sending of Last Forwarding DN as CLID functionality interacts with the ISDN CLID Enhancements feature, in that the CLID entry programmed against the prime DN of the forwarding set at a gateway node is used to build the outgoing CLID.

Incoming Digit Conversion Enhancement

The Incoming Digit Conversion Enhancement (IDC) feature converts incoming digits from a DID route. This feature is supported on the incoming EuroISDN DID routes. Digits received as a called party number are converted if the IDC feature is activated on the route. Digit analysis is then performed on the converted digits by the Meridian 1.

Incoming Trunk Programmable CLID

The Optional Sending of Last Forwarding DN as CLID functionality interacts with the Incoming Trunk Programmable CLID feature. This feature provides the capability of assigning a billing number to incoming trunks.

If the redirection does not occur at the gateway node, the incoming redirecting number information is used as the outgoing CLID on the standard ISDN connectivity DID or CO trunk, even though the Incoming Trunk Programmable CLID feature is configured to send a billing number as CLID information.

Intercept Treatment on Invalid or Partial Dialing

There are three features that are involved in the treatment of calls with dialling irregularities. These are the Partial Dial Timing (PRDL), the Vacant Number Routing (VNR), and the Intercept features.

The Intercept feature allows calls with dialling irregularities to be routed to a Recorded Announcement, an attendant, or to receive overflow or busy tone. Separate treatments can be specified for DID and TIE trunks, for CDP/UDP calls, or for non CDP/ non UDP calls.

The PRDL feature allows to route non-ISDN DID incoming calls to the attendant after a configurable amount of time has expired, if the received digits cannot lead to the completion of the routing.

The VNR feature allows a call to a vacant number to be routed to another node, where the call is either treated as a vacant number, terminated, or given intercept treatment.

In order to provide as much flexibility as possible in the treatment of calls from a EuroISDN interface with dialling irregularities, the PRDL feature has been enhanced. Once the PRDL feature is activated, instead of automatically routing the call to an Attendant, the call will be given the intercept treatment provided by the VNR and Intercept features.

For the PRDL feature, when applied to EuroISDN trunks, the EOD timer used as the PRDL timer must be at least two seconds shorter than the ISDN interdigit timer (T302 = 15 seconds) used for the VNR and Intercept treatments. The call is rejected if T302 times out first. The VNR feature uses another timer which is the NIT timer. Its value is configurable between 3 - 8 seconds, on a per customer basis.

Every time a digit is received, if the number received is an invalid number, the VNR, and then potentially the Intercept treatment feature, are activated.

A number is known to be invalid under the following conditions:

- If Enbloc receiving is configured and an incomplete or invalid number has been received.
- If overlap receiving is configured, and if:
  - an invalid number has been received.
  - an incomplete number with a Sending complete IE has been received.
- If the number received is not completed and not yet invalid, one of the following timer is started:
  - EOD timer (if PRDL =YES)
  - NIT timer for UDP/CDP calls (If PRDL = NO)
  - T302 timer

Interworking Notification

Direct Interworking

When “direct interworking” occurs, the EuroISDN trunk terminates directly on the analog trunk. As a result, the CALL PROCEEDING message is sent to indicate that no further called party information is required. No further call control message is initiated by the analog trunk until answer supervision is provided. If the trunk is a supervised trunk, the resulting CONNECT message will permit the Public Switched Telephone Network (PSTN) to start charging the caller. However, an unsupervised trunk may also be called. In this case, the CONNECT message is sent upon the expiry of the pseudo answer supervision timer.

The destination non-ISDN trunk may be busy instead of ringing; therefore, it is not effective to provide an ALERTING message, since the PSTN provides the caller with ringback. However, the PSTN will be running a T310 timer. Expiry of this timer causes call clearing, and a message must be provided.

The following three alternatives can be configured in Overlay 16 by responding to the PROG prompt to stop the network T310 timer:

1 A PROGRESS message is sent to the network after the CALL PROCEEDING message.

2 An ALERT message is sent to the network after the CALL PROCEEDING message.

3 A CONNECT message is sent to the network after the CALL PROCEEDING message.

Tandem Interworking

When tandem interworking occurs, the EuroISDN trunk terminates on an ISDN link terminating on an analog trunk. When the tandem SETUP message is sent, the CALL PROCEEDING message is sent to the PSTN to indicate that no further called party information is required. The tandem ISDN link returns a PROGRESS message, indicating interworking with a non-ISDN trunk.

Since the PSTN does not implement Annex N, proposed by ETSI, it runs a T310 timer. A message must be provided to stop the T310 timer.

The following three alternatives can be configured in PROG prompt Overlay 16 to stop the network T310 timer:

1 A PROGRESS message is sent to the network after the CALL PROCEEDING message.

2 An ALERT message is sent to the network after the CALL PROCEEDING message.

3 A CONNECT message is sent to the network after the CALL PROCEEDING message.

When interworking with an analog trunk without answer supervised signaling, the Meridian 1 should be configured to send a CONNECT message rather than an ALERT message. An ALERT or CONNECT message stops the receipt of digits, which implies that all digits have been received.

Networking Features

Some networking features currently exist on more than one ISDN interface implemented on the Meridian 1. These features are listed in Table 67. Any networking feature that does not appear in the table is only supported on one ISDN interface and is rejected by the gateway when the service is requested. That is the case for all Meridian Customer Defined Network (MCDN) features that are not supported over the EuroISDN or QSIG interface.

Table 67
Networking features supported by more than one ISDN interface

	Euro-ISDN	MCDN	QSIG	ETSI BRI sets	DPNSS1	MFC	DTI2	Analog
Calling Line ID	Yes	Yes	Yes	Yes	Yes	No	No	No
Connected Number	Yes	Yes	Yes	No	Yes	No	No	No
Transit Counter	No	Yes	Yes	No	Yes	No	No	No

Transfer of Unanswered Call

The EuroISDN Continuation Phase III feature supports the Transfer of an Unanswered Call feature. This allows a station (an attendant or set) to transfer an unanswered outgoing EuroISDN call, after dialing has been completed and before the transferred-to set answers (while the set is ringing). The transferred-to set may be local, or may be remote if the link is an MCDN link equipped with Network Attendant Services (NAS), or if the link is a QSIG link equipped with Slow Answer Recall.

> ***Note:*** The trunk type for the EuroISDN link must be either CO, DID, TIE, FEX, or WATTS for this functionality to work. Otherwise, the transferred-to set must answer before the transfer can be done.

The transfer of an unanswered EuroISDN call interacts with the CDR feature. When the originating party completes the call transfer after the transferred-to set answers, a CDR Start (S) is generated when the transferred-to set answers. When one side releases the call, a CDR End (E) ticket is generated. If the originating party completes the transfer while the transferred-to set is ringing, an S ticket will be generated only when the transferred-to set answers.

Virtual Network Services

A EuroISDN link can be used as a B-Channel for the Virtual Network Services feature.

Feature packaging

The EuroISDN interface is packaged under the EuroISDN (EURO) package 261.

EuroISDN Continuation is included in EuroISDN (EURO) package 261. The following packages are also required:

- Digit Display (DDSP) package 19
- Integrated Services Digital Network (ISDN) package 145
- 2.0 Mb Primary Rate Interface (PRI2) package 154
- Integrated Services Digital Network Supplementary Features (ISDN INTL SUP) package 161
- Overlap Signaling (OVLP) package 184
- International ISDN PRI (IPRA) package 202
- Multi-purpose Serial Data Link (MSDL) package 222

For Basic Rate Interface (BRI), the following software packages are required:

- Digit Display (DDSP) package 19
- Integrated Services Digital Network (ISDN) package 145
- Integrated Services Digital Network Supplementary Features (ISDN INTL SUP) package 161
- International ISDN PRI (IPRA) package 202
- Meridian 1 Extended Peripheral Equipment (XPE) package 203
- Basic Rate Interface (BRI) package 216

- Integrated Services Digital Network Basic Rate Interface Trunk Access (BRIT) package 233

For the Uniform Dialing Plan (UDP), the following packages are also required:

- Basic Routing (BRTE) package 14
- Digit Display (DDSP) package 19
- Network Call of Service (NCOS) package 32
- Network Alternate Route Selection (NARS) package 58

For the Coordinated Dialing Plan (CDP), package 59 is required. Flexible Numbering Plan (FNP) package 160 is optional.

The following packages are required for EuroISDN to interact with Multifrequency Compelled Signaling (MFC), Multifrequency Compelled Signaling for Socotel (MFE), Direct Inward Dialing (DID), Digital Access Signaling System #2 (DASS2), and Digital Private Network Signaling System #1 (DPNSS1):

- Universal ISDN Gateway (UIGW) package 283
- Enhanced DPNSS1 Gateway (DPNSS189I) package 284

The following packages are required for the Numbering Plan Identification (NPI) and Type of Number (TON) fields in CDR:

- Call Detail Recording (CDR) package 4
- Call Detail Recording on Teletype Terminal (CDR_TTY) package 5
- Calling Line Identification in Call Detail Recording (CLID_CDR_PKG) package 118
- New Format for Call Detail Recording (CDR_NEW) package 234

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 15 – Configure the Optional Sending of Forwarding CLID functionality (in response to the OCLI prompt).

2 LD 17 – Create a new D-channel for the EuroISDN interface.

3 LD 16 – Configure new DID routes (the same responses to the IFC and CNTY prompts, as were used in LD 17, must be entered).

4 LD 17 – Configure the Numbering Plan Identification (NPI) and Type of Number (TON) fields to be included in the CDR tickets, in addition to the CLID, for EuroISDN calls (this is automatically done by entering YES in response to the CLID prompt).

LD 15 – Configure the Optional Sending of Forwarding CLID functionality (in response to the OCLI prompt).

Prompt	Response	Description
REQ:	CHG	Change existing data.
TYPE:	NET	Networking data.
CUST	xx	Customer number.
...		
ISDN	YES	Integrated Services Digital Network.
PNI	(0)-32700	Private Network Identifier.
...		
SATD	0-(1)-5	Satellite Delays.

OCLI	(NO) EXT ALL	NO = No manipulation is done on outgoing CLID for calls forwarded over EuroISDN links. EXT = The last forwarding DN is sent as CLID information for incoming calls over a standard ISDN (EuroISDN, APAC, NI-2) DID or CO link to a gateway Meridian 1 node, and redirected back over the standard ISDN (EuroISDN, APAC, NI-2) DID or CO link. ALL = The same as for EXT. Moreover, the last forwarding DN is sent as CLID information for internal calls from a local set or over ISDN TIE trunks, except for DPNSS1 calls which are redirected from a gateway node over a standard ISDN (EuroISDN, APAC, NI-2) DID or CO link. If the redirection does not occur at the gateway node, the redirecting information number, if present in the incoming SETUP message received at the gateway node from the private network, is sent as CLID.

LD 17 – Create a new D-channel for the EuroISDN interface.

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	ADAN	Action Device and Number.
- ADAN	NEW DCH x	New D-channel at port number x.
- CTYP	MSDL	Card type, where MSDL = Multipurpose Serial Data Link for Meridian Options 51C-81C, or Downloadable D-Channel Board for Option 11C.
- GRP	0-4	Network Group Number.
- DNUM	0-15	Device number for I/O ports.
- PORT	0-3	Port number on MSDL card.
- USR	PRI	D-channel for ISDN PRI only. Precede with X to remove.

- IFC		DCH interface type.
	EURO E403	EURO = EuroISDN E403 = EuroISDN Interface conforming to the ETS 300 403, or the extended ETS 300 102 version for country-specific interfaces. Refer to the Note on page 892
- - CNTY		Enter country pertaining to EuroISDN interface.
	AUS DEN (ETSI) FIN GER ITA NOR POR SWE EIR DUT SWI BEL ESP UK FRA CIS EAUS	Austria Denmark ETS 300-102 basic protocol Finland Germany Italy Norway Portugal Sweden Ireland Holland Switzerland Belgium Spain United Kingdom France Commonwealth of Independent States (Russia and the Ukraine). Australia ETSI.
		Enter country pertaining to the E403 interface. If either ETSI or NET are entered, the interface is fully compliant with ETS 300 403. See the Note on page 892.
	ETSI NET	ETS 300 403 for the user side. ETS 300 403 for the network side.
		If any of the countries listed for the EURO IFC are entered, the interface functions with the extended ETS 300 102 capabilities. See the note on page 892.
PINX_CUST	xx	The customer number used for the DN address.
...		
DCHL	0-159	The PRI loop number for the D-Channel.

- - CNEG	(1) 2	Channel Negotiation option. (1) = Channel is indicated and no alternative is acceptable. This is the default value for all EuroISDN Interfaces except FRA. 2 = Channel is indicated and any alternative is acceptable. This is the default value for the FRA interface.
- RCAP	COLP XCOL	Enter COLP to support Connected Line Identification Presentation as a remote capability. This is the default value for the EAUS, ESIG, ISIG, NI2, and EURO interfaces. Enter XCOL to remove Connect Line Identification Presentation as a remote capability. This is the default value for the AUS, EIR, DEUT, ESP, BEL, and FRA interfaces.

LD 16 – Configure new DID routes (the same responses to the IFC and CNTY prompts, as were used in LD 17, must be entered).

Prompt	**Response**	**Description**
REQ	NEW CHG	Add new data. Change or delete existing data.
TYPE	RDB	Route Data Block.
CUST	xx	Customer number.
ROUT	0 - 511 0-127	Route Number. For Option 11C.
TKTP	 DID COT	Trunk type. DID = Direct Inward Dialing COT = Central Office.
...		
DTRK	YES	Digital trunk route.
- DGTP	PRI2 BRI	Digital trunk type for route.
...		

- IFC		DCH interface type.
	EURO	EURO = EuroISDN
	E403	E403 = EuroISDN Interface conforming to the ETS 300 403, or the extended ETS 300 102 version for country-specific interfaces. Refer to the Note on page 892
- - CNTY		Enter country pertaining to EuroISDN interface.
	AUS	Austria
	DEN	Denmark
	(ETSI)	ETS 300-102 basic protocol
	FIN	Finland
	GER	Germany
	ITA	Italy
	NOR	Norway
	POR	Portugal
	SWE	Sweden
	EIR	Ireland
	DUT	Holland
	SWI	Switzerland
	BEL	Belgium
	ESP	Spain
	UK	United Kingdom
	FRA	France
	CIS	Commonwealth of Independent States (Russia and the Ukraine).
	EAUS	Australia ETSI.
		Enter country pertaining to the E403 interface. If either ETSI or NET are entered, the interface is fully compliant with ETS 300 403. See the Note on page 892.
	ETSI	ETS 300 403 for the user side.
	NET	ETS 300 403 for the network side.
		If any of the countries listed for the EURO IFC are entered, the interface functions with the extended ETS 300 102 capabilities. See the note on page 892.
ICOG	IAO	Incoming and Outgoing trunk.
	OGT	Outgoing trunk only.
	ICT	Incoming trunk only.
ACOD	x..x	Access code for this trunk route.

- CLID	OPT0	Prefix = 0, for North American dialing plan. This is the default value for ESIG and ISIG interfaces.
	OPT1	Prefix = 1, for international PFXs in CLID, any numbering type supported. This is the default value for all EuroISDN interfaces.
	OPT2	Prefix = 2, for international PFXs in CLID, CCITT numbering type supported: UKWN, INTL, NPA, and NXX. Default value for CO/DID routes for the Telecom New Zealand interface.
	OPT3	Prefix = 3, for international PFXs in CLID, only NXX number type supported. Default value for TIE routes for the Telecom New Zealand interface.
	OPT4	For international COs, if the call originates from a CO trunk type, add nothing. Otherwise, add PFX1 and PFX2. This is the default value for the Hong Kong, Singapore, and Thailand interfaces.
	OPT5	This is the same as OPT4, except it supports a maximum of 10 digits in the CLID. This is the default value for the Austrian interface.
PROG		Progress Signal.
	NCHG	Send PROGRESS (default value for all interfaces, except Austria).
	MALE	Send ALERT after CALL PROCEEDING.
	MCON	Send CONNECT after CALL PROCEEDING (this is the default value for the Austrian interface).
...		
- RCAP	COLP XCOL	Enter COLP to support Connected Line Identification Presentation as a remote capability. This is the default value for the ESIG, ISIG, NI2, and EURO interfaces. Enter XCOL to remove Connect Line Identification Presentation as a remote capability. This is the default value for the AUS, EIR, DEUT, ESP, BEL, and FRA interfaces.
...		

- CPFXS	(YES) NO	Customer-defined Prefixes option. This prompt is added as one of the sub-prompts of ISDN = YES. It is added at the end of the ISDN sub-prompts. If CPFXS = YES, when constructing the Calling or Connected Line Identification, the prefixes are retrieved from the Customer Data Block via the PFX1 and PFX2 prompts in LD 15, as is currently done. This is the default response. If CPFXS = NO, when constructing the Calling or Connected Line Identification, the prefixes are retrieved from the Route Data Block via the HNTN and HLCL prompts in LD 16.
- - HNTN	0-9999	Home National Number. This number is similar to the PFX1 number prompted in LD 15. It is added to this overlay so that this prefix can be configured on a route basis as required in some countries (e.g., Italy). As is the case with PFX1, the HNTN prefix can be from one-to-four digits long. This prompt is displayed only if CPFXS = NO. If only a <CR> is entered, this prompt keeps its previous configuration. If no value was configured previously, no value will be configured. Enter X to delete the digits.
HLCL	0-9999	Home Location Number. This number is similar to PFX2 number prompted in LD 15. It is added to this overlay so that this prefix can be configured on a route basis as required in some countries (e.g., Italy). As is the case with PFX2, the HLCL prefix can be from one-to-four digits long. This prompt is displayed only if CPFXS = NO. If only a <CR> is entered, this prompt keeps its previous configuration. If no value was configured previously, no value will be configured. Enter X to delete the digits.
ADDP	(NO)	If ADDP = NO, the Calling or Connected Party Number displayed is not modified.
	YES	If ADDP = YES, the prefixes 0 (national) or 00 (international) are added to the Calling Party Number if the Type of Number (TON) is public.

LD 17 – Configure the Numbering Plan Identification (NPI) and Type of Number (TON) fields to be included in the CDR tickets, in addition to the CLID, for EuroISDN calls (this is automatically done by entering YES in response to the CLID prompt).

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	PARM	Change system parameters.
...		
- FCDR	NEW	Format for Call Detail Recording. Enter NEW for new format.
...		
- CLID	(NO) YES	Enter YES to include the TON and NPI fields in the CDR ticket, in addition to the CLID.
...		

Feature operation

There are no operating procedures specified for this feature.

Japan D70, non-Asia Pacific connectivity

Description

This feature provides ISDN PRI connectivity between the Meridian 1 and the INS1500 D70 for Japan. The design in based on the 23 B+D PRI configuration.

Meridian 1 to Japan D70 ISDN PRI connectivity supports the following:

- Basic Call Service
- Calling Line Identification (public and private)
- Overlap Sending
- COT, DID, DOD, and TIE trunk call types
- 64 kbps clear bearer capability
- Channel Negotiation

- nB+D, up to 120 B-channels/four interfaces
- Public Switched Telephone Network (PSTN) three-party conferencing
- Flexible Numbering Plan
- Malicious Call Trace

Operating parameters

For the ISDN layer 1 interface, the circuit pack QPC720 (Digital Trunk Interface) is used for the Meridian 1 to D70 connectivity.

The QPC757E version of the D-channel Handler (DCH) circuit pack provides the Layer 2 functions and incoming Layer 3 preprocessing for the Meridian 1 to D70 connectivity.

The NTAK09AA (DTI/PRI) circuit pack is used for Option 11 systems, along with the NTAK93 D-channel Interface (DCHI) and NTAK20 Clock Controller.

A Multi-purpose Serial Data Link (MSDL) can be used in place of the DCH circuit pack (NT6D80AA).

Feature interactions

PRI Channel Negotiation

When a D-channel has one or more secondary PRIs associated with it while using the D70 interface, channel negotiation requires that the PRI interface be explicitly defined for all B-channels not on the primary interface.

Feature packaging

For Japan D70 ISDN PRI connectivity, the following software packages are required:

- Digit Display (DDSP) package 19 for CLID;
- 1.5 Mb Digital Trunk Interface (PBXI) package 75;
- Integrated Services Digital Network (ISDN) package 145;
- 1.5 Mb Primary Rate Access (PRA) package 146;
- International Primary Rate Access (IPRA) package 202; and

- Multi-purpose Serial Data Link (MSDL) package 222 for use of the MSDL card in place of the DCH card.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 17 – Define the ISDN PRI to D70 connectivity.

2 LD 16 – Define the ISDN PRI to D70 connectivity.

LD 17 – Define the ISDN PRI to D70 connectivity.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	CFN	Configuration record.
- ADAN	CHG DCH x	Change a D-channel on logical port 0-63 (all other machine types).
	CHG DCH xx	Change a D-channel on logical port 0-15 (Option 11).
...	...	...
- IFC	D70	Interface type for Japan D70 connectivity.
- CNEG	(1) 2	The required channel negotiation option, either exclusive (the default) or preferred.

LD 16 – Define the ISDN PRI to D70 connectivity.

Prompt	Response	Description
REQ	NEW CHG	New, or change.
TYPE	RDB	Route Data Block.
CUST	xx	Customer number.
ROUT	xxx	Route number.

...	...	...
IFC	D70	Interface type for Japan D70 connectivity.

Feature operation

There are no operating procedures specified for this feature.

ISDN QSIG

Contents

The following are the topics in this section:

Regional material statement 915
Feature description 916
Operating parameters 917
Feature interactions 917
Feature packaging 919
Feature implementation 919
Task summary list 919
Feature operation 921

Regional material statement

ISDN BRI trunking is not available in North America. Contact your system supplier or your Nortel Networks representative to verify support of this product in your area.

Feature description

The European Computer Manufacturer's Association (ECMA) has defined an ISDN protocol that specifies the Layer 3 signaling requirement for support of circuit switched call control at the "Q" reference point between Private Telecommunications Network Exchanges (PTNXs) connected within a Private Telecommunications Network (PTN). This protocol has been adopted by the European Telecommunications Standards Institute (ETSI) and the International Standards Organization (ISO). Most of the major European PTNX manufacturers will be supporting ISDN connectivity based on this standard.

QSIG is oriented towards signaling and services that occur between two switches. For example, two PBXs, or a PBX and a Centrex switch could exchange signaling for services across a "Q" reference point.

The QSIG interface will support the following services:

- Call Establishment and Tear Down
- ETSI or ISO version of basic call
- 64 kbps clear data
- Overlap Sending/Receiving
- Channel Negotiation
- Calling and Connected Parties Information (CLIP/COLP)
- Calling and Connected Parties Restriction (CLIR/COLR)
- Flexible Numbering Plan
- TIE call types
- nB+D with n ranging from 1 to 480 for PRI
- Transit Count information transmitted when ISDN Call Connection Limitation (ICCL) is present

The QSIG interface is supported on PRI, and BRI, and ISDN Signaling Links (ISLs).The QSIG interface does not have any transit capability for supplementary services, nor does it support any supplementary services besides the CLIP/COLP and CLIR/COLR.

QSIG development underscores Nortel Network's commitment to global standards. QSIG will provide a greater interworking of voice, image, video, and data services in multi-vendor environments. Users will also be able to combine ISDN PRI with ISDN BRI to deliver enhanced services via end-to-end ISDN networks.

Operating parameters

There are no operating parameters specified for this feature.

Feature interactions

Networking Features

Some networking features currently exist on more than one ISDN interface implemented on Meridian 1. These features are listed in Table 68. Any networking feature that does not appear in the table is only supported on one ISDN interface and is rejected by the gateway when the service is requested. That is the case for all Meridian Customer Defined Network (MCDN) features that are not supported over the QSIG interface.

Table 68
Networking features that exist on more than one ISDN interface implemented on Meridian 1

	Euro-ISDN	MCDN	QSIG	BRI sets	DPNSS	MFC	MFE	DTI2	Analog	1TR6	NUMERIS	AXE10
Calling Line ID	Y	Y	Y	Y	Y	Y	N	N	N	Y	Y	Y
Connected Number	Y	Y	Y	N	Y	N	N	N	N	Y	N	N
Transit Counter	N	Y	Y	N	Y	N	N	N	N	N	N	N
Call Charge	Y	N	N	N	N	N	N	Y	Y	Y	Y	N

Trunk Route Optimization

Trunk Route Optimization (TRO) is supported within the Meridian 1 network only. When a redirecting node sends a message to the originating node and the TRO request is accepted, the new call can go through the QSIG interface as a normal basic call. However, TRO signaling will not be able to operate on the QSIG interface.

Network Call Redirection

The existing Network Call Redirection limitation on unsupported interfaces applies to the QSIG interface. When a call is terminated on the Meridian 1 and network call redirection is active, the feature can still be operated but the Original Called number and the Redirection number Information Elements (IEs) which are used by the Network Call Redirection feature will not be sent on by the QSIG interface.

ISDN Signaling Link (ISL)

The existing ISL operation is supported on the QSIG interface on the PRI/PRI2 interface only.

Network Attendant Service (NAS)

The interaction with NAS is as though the call is going to a route without NAS equipped. The only information exchanged between NAS and the QSIG interface is the transit count. Other information contained in the Progress IE will be handled by a future development.

Call Forward, Break-In and Hunt Internal or External Network Wide

Call Forward, Break-In and Hunt Internal or External Network Wide uses the Network Attendant Service equivalent information that is transported on protocols such as Party Category and Progress Indicator for QSIG.

Virtual Network Services (VNS)

VNS provides ISDN features when no MCDN link is available between two switches. This can be done when analog lines are available or when ISDN links that provide no supplementary services are used. The existing link is used as a B-channel, and a separate D-channel handles the MCDN signaling between the two end switches.

A QSIG link can be used as a B-channel for the VNS feature over a private network. All VNS services are then supported as normal; the QSIG link is only used as a speech bearer.

Feature packaging

A new QSIG Interface (QSIG) package 263 must be provisioned to activate this feature.

The following software packages are also required for QSIG:

- Digit Display (DDSP) package 19;
- Integrated Services Digital Network (ISDN) package 145;
- Primary Rate Access (PRA) package 146;
- 2.0 Mb Primary Rate Access (PRI2) package 154;
- Overlap Signaling (OVLP) package 184;
- International Primary Rate Access (IPRA) package 202.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 17 – Assign the configuration record.

2 LD 16 – Define a Route Data Block.

3 LD 97 – This overlay defines the Extended Peripheral Equipment (XPE) configuration.

LD 17 – Assign the configuration record.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	CFN	Configuration Record.
...		
IFC	ISIG ESIG	Interface ID for ISO QSIG. Interface ID for ETSI QSIG.
TIMR	(NO) YES	NO = skip timer prompt. YES = change timer value.
T310	10-(30)-60	10-60 seconds (one-second increments). 30 seconds is the default value.

LD 16 – Define a Route Data Block.

Prompt	Response	Description
REQ	NEW, CHG	New, or change.
TYPE	RDB	Route Data Block.
...		
DGTP	PRI BRI	Digital route type.
IFC	ISIG ESIG	New DCH interface ID.

LD 97 – This overlay defines the Extended Peripheral Equipment (XPE) configuration.

Data relating to the software downloading for the MSDL card will remain in the overlay. Hence, this overlay must be modified to accept the parameters required for downloading the PRI application data files. The parameters basically specify conditional or forced downloading.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	SYSM	System parameters for MSDL/MISP cards.
...		
FDLC		Peripheral Software Download Option.
	P1	This will be set to the application and its data files, such as BRIE, and PRIE.
	P2	Specifies conditional (C) or forced downloading (F).

Feature operation

There are no operating procedures specified for this feature.

ISDN QSIG Alternate Routing

Contents

The following are the topics in this section:

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Originating node operation 927
Operating parameters 929
Feature interactions 930
Feature packaging 931
Feature implementation 931
Task summary list 931
Feature operation 933

Regional material statement

The information presented in this section does not pertain to all market regions. Contact your system supplier or your Nortel Networks representative to verify support of this product in your area.

Feature description

The ISDN QSIG Alternate Routing feature provides a solution to calls encountering congestion due to high traffic situations within a QSIG network. Both the QSIG interface protocols, European Telecommunications Standard Institute (ETSI), and International Standards Organization (ISO), are supported by this feature.

This feature uses the routing capability of Network Alternate Route Selection (NARS) to re-route a congested call. For each QSIG call translated at a Meridian 1 node, NARS selects one route from up to 512 routes to complete the call. These routes are programmed in a route list. Each route in the list is called an entry. There may be up to 64 entries in each route list. Any combination of trunks (such as public exchange, TIE) can be specified in a route list.

QSIG Alternate Routing may be configured for each of the 512 different routes.

Congestion occurs when all trunks of a route are busy. With the introduction of the QSIG Alternate Routing feature, each entry of a route list on one node can be configured to take an alternate entry (route) from the route list of that node (Private or Public Exchange), if congestion is encountered.

Using LD 86, the Electronic Switched Network (ESN) administration overlay, the option defined for the Step Back On Congestion (SBOC) prompt determines the type of alternate routing available to calls over a particular route. These options may be as follows:

- NRR (no alternate routing is performed. The call receives congestion treatment).
- RRO (reroute if a call encounters congestion at the originating node. If congestion is encountered at a transit node, the call drops back to the originating node, so that the originating node decides if re-routing is required. The drop-back functionality, which is part of the ISDN Drop Back Busy feature, is also configured in LD 86, using the IDBB prompt).
- RRA (reroute the call at any node, whether congestion is encountered at the originating or transit node).

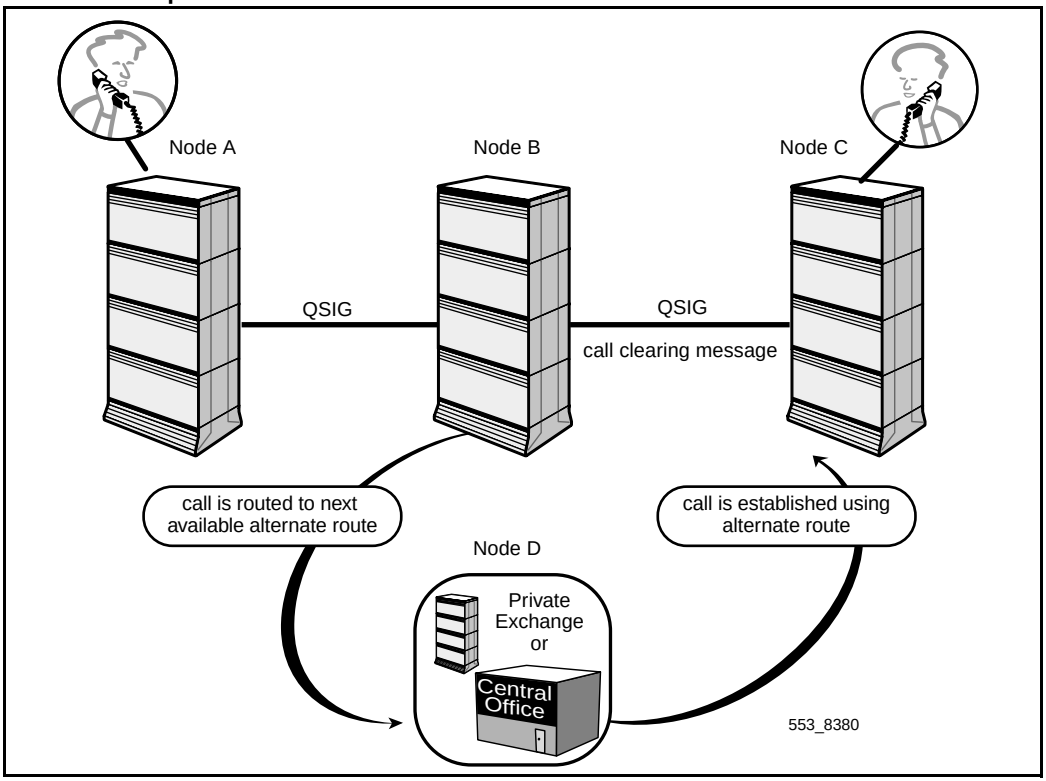
QSIG Alternate Routing is triggered at the controlling node when a Call Clearing message (DISCONNECT or a REJECT) is received, and the cause value is to activate QSIG Alternate Routing. The cause values are defined using LD 86 (see page 932).

Transit node operation

Consider the following calling scenario for a transit node operation (refer to Figure 72). An attempt is being made to establish a call over a QSIG link, from originating node A to terminating node C, via transit node B. All the trunks pertaining to the call attempt at node C are busy. Node C sends congestion message information, along with a supported QSIG Alternate Routing cause value, back to node B.

At node B, the SBOC option, as defined in LD 86, is checked to determine the routing treatment. If SBOC = RRA, the next free alternate route is tried. In our example, the first free alternate route that is found is between node B and node D. Node D can either be a Private or Public Exchange. If the Network Class of Service access checks are passed, the direct leg between the congested node (node C) is released, and a indirect new leg is created to node C, through node D. The call would then be established from node A, to node B, to node D, to node C.

Figure 72
Transit node operation



An attempt is made to find a free alternate route until all of the alternate routes, as defined in LD 86 (refer to the ROUT prompt on page 932), are tried. If no free alternate route is available, the congestion message information is sent from node B to the originating node A, where the QSIG Alternate Routing functionality is activated. If no alternate routes are found, the call receives network blocking treatment, as defined by prompt NBLK in LD 15, as part of the initial customer configuration.

If SBOC = RRO, the congestion information is passed back from transit node B to the originating node A. At node A, QSIG Alternate Routing is activated in an attempt to find an alternate route to set up the call from node A, to node B, to node D, to node C.

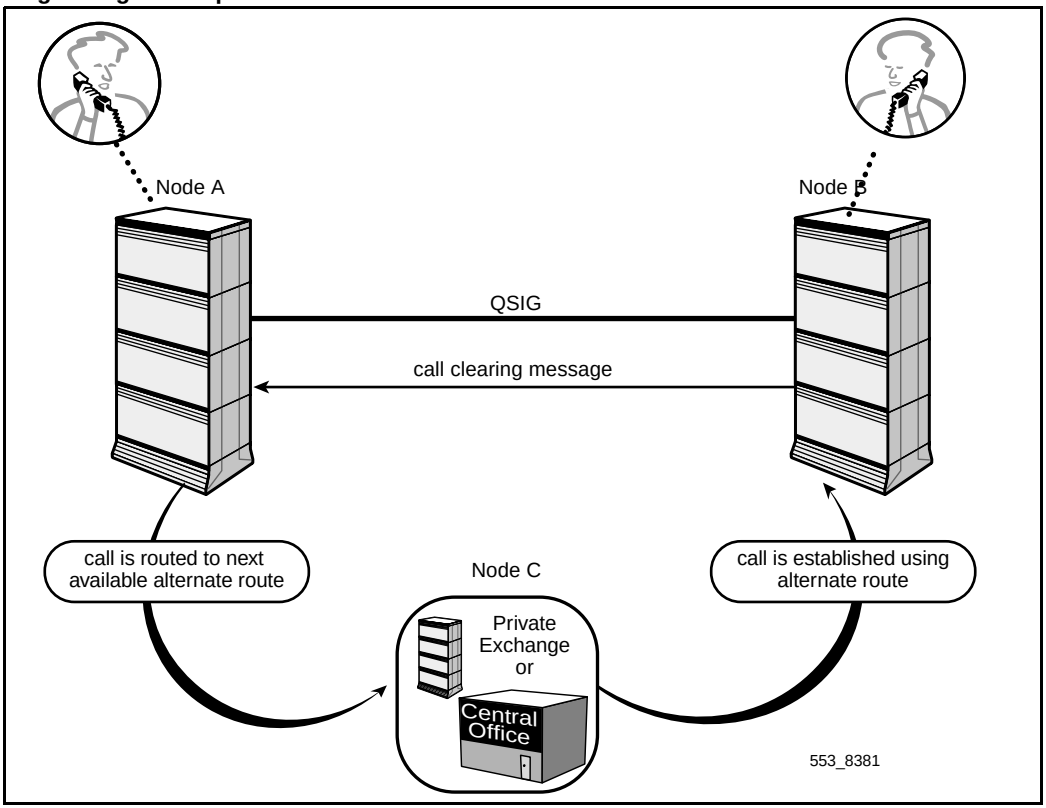
If SBOC = NRR, no alternate routing is performed. The call receives network blocking treatment, depending on the congestion cause value and the type of treatment defined by prompt NBLK in LD 15.

Originating node operation

Consider the following calling scenario for an originating node operation (refer to Figure 73). An attempt is being made to establish a call over a QSIG link, from originating node A to terminating node B. All the trunks All the trunks pertaining to the call attempt at node B are busy, so node B sends congestion message information, along with a supported QSIG Alternate Routing cause value, back to node A.

At node A, the SBOC option, as defined in LD 86, is checked to determine the routing treatment. If SBOC = RRA or RRO, the next free alternate route is tried. In our example, the first free alternate route that is found is between node A and node C. Node C can either be a Private or Public Exchange. If the Network Class of Service access checks are passed, the direct leg between the congested node (node B) is released, and a new indirect leg is created to node B, through node C. The call would then be established between node A, to node B, to node C.

Figure 73
Originating node operation



An attempt to find a free alternate is made until all of the alternate routes, as defined in LD 86 (refer to the ROUT prompt on page 932), are tried. If no alternate routes are found, the call receives network blocking treatment, as defined by prompt NBLK in LD 15, as part of the initial customer configuration.

If SBOC = NRR, no alternate routing is performed. The call receives network blocking treatment, depending on the congestion cause value and the type of treatment defined by prompt NBLK in LD 15.

Operating parameters

There are two forms of QSIG Call Transfer - QSIG Call Transfer by the “rerouting” method, and QSIG Call Transfer by the “join” method. QSIG Alternate Routing and the QSIG Call Transfer by the “re-routing” method are mutually exclusive.

Optional Information Elements (IEs) may be lost at a rerouting node. Only the following optional Information Element (IEs) are tandemmed in the SETUP of the alternate call, if they are present in the congested call:

- Calling number
- Called and calling subaddress
- High layer compatibility
- Low layer compatibility

On a QSIG network, optional IEs (like progress IEs) carried in the SETUP messages are lost when the alternate routing occurs at a transit node. Mandatory IE are always tandemmed transparently.

GF facility information is lost at a transit node. If QSIG Alternate Routing is performed, Facility IEs contained in the SETUP message are lost, so services like QSIG Name Display, QSIG Call Diversion (rerouting and by join method) are not delivered to the end-user. QSIG Alternate Routing is exclusive with QSIG Call Transfer, if the rerouting method is used. This does not have a major impact, since QSIG Call Transfer by rerouting is optional, whereas QSIG Call Transfer by join is mandatory. It is therefore advised that if a third-party PBX is part of a QSIG network, QSIG Call Transfer by join method is used.

Missing progress IEs due to QSIG Alternate Routing activation may create a situation where a call fails involving an ISDN BRI set. This may occur when a Meridian proprietary set calls an ISDN BRI set over a QSIG link, and QSIG Alternate Routing is triggered. In this case the Progress Indicator Number 3 “Originator is not ISDN” is lost.

Route Access codes are not supported. A Coordinated Dialing Plan (CDP) or a Uniform Dialing Plan (UDP) is required for the QSIG Alternate Routing feature.

Feature interactions

Drop Back Busy and Off-Hook Queuing

QSIG Alternate Routing takes precedence over ISDN Drop Back Busy, if both are configured on an MCDN-to-QSIG gateway node.

Intercept treatment

If QSIG Alternate Routing fails to find an alternate route for a call encountering congestion at a transit node, intercept treatment is not applied at the transit node. The call is dropped back to the originating node, with the appropriate congestion IE information.

Overlap Sending

QSIG Alternate Routing is supported over both the enbloc and overlap signaling methods.

QSIG Name Display

When QSIG Alternate Routing is triggered at a tandem node, no calling name display information is sent in the call SETUP message for the new call over the alternate route. However, the calling name display information is sent from an originating node or at an MCDN-to-QSIG gateway node, if it is available.

QSIG Path Replacement

QSIG Alternate Routing cannot be applied to a QSIG Path Replacement call set-up. Therefore, QSIG Path Replacement is rejected if congestion is encountered.

Virtual Network Services

QSIG Alternate Routing can function over all QSIG-based bearer interfaces supporting Virtual Network Services.

MCDN End to End Transparency

When QSIG Alternate Routing is triggered at a tandem node, the Facility IE messages containing the Network Attendant Services (NAS) and Network Attendant ACD (NACD) information are not included in the SETUP message for the new call over the alternate route.

Feature packaging

The following packages are required for the QSIG Alternate Routing feature:

- Basic Routing (BRTE) package 14
- Network Class of Service (NCOS) package 32

One of the following:

- Basic Alternate Route Selection (BARS) package 57
- Network Alternate Route Selection (NARS) package 58
- Coordinated Dialing Plan (CDP) package 59

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 86 – Configure the QSIG Alternate Routing options.

LD 86 – Configure the QSIG Alternate Routing options.

QSIG Alternate Routing may be configured for each of the 512 different routes.

Prompt	Response	Description
REQ	CHG	Change existing data.
CUST	xx	Customer number, as configured in LD 15. xx = 0-99 for Options 51C-81C xx = 0-31 for Option 11C.
FEAT	RLB	Configure the Route List as a feature.
MXLC	0-1000	Maximum number of NARS Location Codes.
RLI	xxx	Route List Index to be accessed. xxx = 0-127 if a Coordinated Dialing Plan is used. xxx = 0-255 if NARS is configured. xxx = 0-999 if the Flexible Numbering Plan is configured.
ENTR	0-63	Entry number for the NARS route list.

ROUT	0 - 511 0-127	Route Number for Options 51C-81C. Route Number for Option 11C.
...		
SBOC		Step Back On Congestion option.
	(NRR)	No re-routing.
	RRO	Re-route if congestion is encountered at the originating node; if congestion is encountered at a transit node, drop-back to the originating node, so that the originating node decides if re-routing is needed (the IDBB prompt in this LD 86 must be set to DBA or DBI).
	RRA	Re-route whether congestion is encountered at the originating or tandem node.
- COPT		Conditions that may cause QSIG Alternate Routing. These values are contained in signaling messages that trigger alternate routing. The COPT prompt is generated only if SBOC = RRO or RRA.
	(1)	QSIG Alternate Routing is supported due to the following causes: — Cause 34, “No Channel or Circuit Available” — Cause 38, “Network Out of Order” — Cause 42, “Congestion”
	2	QSIG Alternate Routing is supported due to the following causes: — Cause 27, “Destination is Out of Service” — Cause 34, “No Channel/Circuit Available” — Cause 38, “Network Out of Order” — Cause 42, “Congestion”

IDBB		ISDN Drop Back Busy options.
	(DBD)	Deny Drop Back Busy.
	DBA	Allow Drop Back Busy on, if all route sets are busy.
	DBI	Allow Drop Back Busy, if all Initial route sets are busy.
...		

Feature operation

No operating procedures are required to use this feature.

ISDN QSIG Basic Call

Contents

The following are the topics in this section:

Regional material statement 935
Feature description 935
Operating parameters 936
Feature interactions 937
Feature packaging 938
Feature implementation 939
Task summary list 939
Feature operation 940

Regional material statement

ISDN BRI trunking is not available in North America. Contact your system supplier or your Nortel Networks representative to verify support of this product in your area.

Feature description

Integrated Services Digital Network (ISDN) Q Reference Signaling Point (QSIG) Basic Call complies with the ISDN protocol that specifies the Layer 3 signaling requirement for support of circuit switched call control at the “Q” reference point between Private Telecommunications Network Exchanges (PTNXs) connected within a Private Telecommunications Network (PTN).

This protocol has been adopted by the European Telecommunications Standards Institute (ETSI) and the International Standards Institute (ISO). Most of the major European PTNX manufacturers will be supporting ISDN connectivity based on this standard. This applies to both ISDN PRI and ISDN BRIT (trunk application.)

QSIG is oriented toward signaling and services that occur between two "peer-to-peer" switches across a "Q" reference point. For example, two PBXs, a PBX and a Centrex switch or two Centrex switches could exchange signaling and services across a "Q" reference point.

The ISDN QSIG Basic Call feature introduces the following basic call services on Meridian 1 ISDN 1.5 Mbit PRI on QSIG connectivities (these services were previously available only on ISDN 2.0 Mbit PRI connectivities):

- Basic Call Service
- 64 K clear bearer capability
- TIE call types
- Connected number delivery (COLP/COLR)
- Channel Negotiation
- Flexible Numbering Plan
- Enbloc dialing
- Overlap sending
- Overlap receiving
- Calling Line Identification Presentation and Restriction (CLIP/CLIR)
- Loop avoidance (transit count) on ETSI QISG, not on ISO QSIG
- Party Category on ETSI QISG, not on ISO QSIG.

Operating parameters

Meridian Customer Defined Network (MCDN) features cannot be interworked between an MCDN and QSIG interface, with the exception of basic call, Calling Line Identification Presentation/Restriction and Calling and Connected Line Presentation/Restriction.

Meridian 1 accepts up to three Progress Information Elements (IE) in one message on the QSIG interface.

The maximum length of an ISDN message is limited to 260 bytes.

Only circuit mode connection is supported.

nB+D is not supported for QSIG.

Feature interactions

Backup D-Channel

Backup D-Channel is not supported on the QSIG interface.

ISDN Signaling Link

ISDN Signaling Link (ISL) on QSIG operation is not supported on ISDN BRI trunking for Options 51C to 81C. For Option 11C, ISL on QSIG is not supported.

Network Attendant Services

ISDN QSIG Basic Call interacts with Network Attendant Services (NAS) as if the call is going to a route without NAS being equipped.

Network Automatic Call Distribution

Network Automatic Call Distribution signaling is not supported on the QSIG interface. Network ACD operation on QSIG is the same as the existing Network ACD treatment for unsupported interfaces.

Network Call Redirection

When a call is terminated on the Meridian 1 and Network Call Redirection (NCR) is active, the QSIG Basic Call can still operate; however, the original called number and redirection number IE that are used by NCR will not be sent on the QSIG interface.

Network Call Trace

Network Call Trace is not supported on the QSIG interface.

Network Calling Party Name Display

Network Calling Party Name Display (NCPND) is supported within the Meridian Customer Defined Network only. When QSIG is involved in the call setup, the existing NCPND operation on unsupported interfaces applies on QSIG.

Network Message Service

Network Message Service (NMS) is only supported on the Meridian Customer Defined Network. NMS operation on QSIG is the same as the existing treatment for unsupported interfaces.

Network Ring Again

Network Ring Again signaling is supported within the Meridian Customer Defined Network only. Network Ring Again requests which go through the QSIG interface will not be supported.

Remote Virtual Queuing

Remote Virtual Queuing (RVQ) does not operate on the QSIG interface. The existing RVQ operation on unsupported interfaces applies on the QSIG interface.

Trunk Route Optimization

Trunk Route Optimization (TRO) is supported within an MCDN network only. When a redirecting node sends a message to the originating node and the TRO request is accepted, the new call will go through the QSIG interface just as a normal basic call. However, TRO signaling will not be able to operate on the QSIG interface.

Virtual Network Service

A QSIG link can be used as a B-channel for the Virtual Network Service (VNS) over a private network. All VNS services are supported as normal. QSIG is only used as a speech bearer.

Feature packaging

The following packages are required for ISDN QSIG Basic Call services:

- Digit Display (DDSP) package 19;
- Integrated Services Digital Network (ISDN) package 145;
- Primary Rate Access (PRI) package 146;

- 2.0 Mb Primary Rate Access (PRI2) package 154;
- Overlap Signaling (OVLP) package 184;
- International Primary Rate Access (IPRA) package 202;
- ISDN QSIG Basic Call (QSIG) is package 263.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 17 – Assign Configuration Record.

2 LD 16 – Define the Route Data Block.

3 LD 97 – System Configuration.

LD 17 – Assign Configuration Record.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	ADAN	Action Device and Number.
- ADAN	CHG DCH x	Change input/output device. x = 0-63
...		
- - IFC	ISIG ESIG	Interface ID for ISO QSIG download table. Interface ID for ETSI QSIG download table.
...		
TIMR	(NO) YES	NO = skip timer prompt. YES = change timer value.
T310	110 - (120)	The timer is used to define how long Meridian 1 can wait for the response message when the QSIG outgoing call is in an outgoing call proceeding state.

LD 16 – Define the Route Data Block.

Prompt	Response	Description
REQ	NEW CHG	New, or change.
TYPE	RDB	Route Data Block.
DTRK	YES	Digital Trunk Route.
...		
DGTP	PRI PRI2 BRI	1.5 Mb PRI. 2.0 Mb PRI. Basic Rate Interface.
IFC	ISIG ESIG	New DCH interface identification as entered in LD 17.

LD 97 – System Configuration.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	SYSM	System parameters for Multi-purpose Serial Data Link (MSDL) or Multi-purpose ISDN Signaling Processor (MISP).
...		
FDLC	 p1 p2 p3 p4	Fast download control parameters. p1 = Application will be set to PRIE or BRIE. p2 = Specifies conditional (C) or forced downloading (F). p3 = Specifies current (C), latest (L) and specified (S) version. p4 = xx (version number if p3 = S).

Feature operation

There are no operating procedures specified for this feature.

ISDN QSIG-BC and QSIG-GF Compliance Update

Contents

The following are the topics in this section:

Regional material statement 941
Feature description 941
QSIG Basic Call Compliance Update 942
QSIG GF Compliance Update 943
Operating parameters 945
Feature interactions 946
Feature packaging 946
Feature implementation 947
Task summary list 947
Feature operation 948

Regional material statement

ISDN BRI trunking is not available in North America. Contact your system supplier or your Nortel Networks representative to verify support of this product in your area.

Feature description

Two European QSIG interfaces are available. One version (called the ISDN QSIG-BC and QSIG-GF Compliance Update) is compliant with latest editions of the standards. The other version is compliant with older versions of the standards.

The ISDN QSIG-BC and QSIG-GF Compliance Update feature is compliant with the following European standards documents for QSIG:

- ETS 300-172, fourth edition (1997)
- ETS 300-239, second edition

Initially, support for the ISDN QSIG interface and the basic call capability was introduced. This version of the interface was based on the ETS 300-172, first edition (1990) document.

Later, the QSIG-GF Transport interface was introduced, in accordance with the ETS 300-239 (1993) standard document. The basic call functionality was upgraded to be compliant with the second edition of the ETS 300-172 document.

QSIG Basic Call Compliance Update

Comprehension required IEs

When an incoming Information Element (IE) coded “comprehension required” is not recognized, the system treats the message the same way it treats messages with a mandatory information element missing. A message is sent back with cause 96 “mandatory information element missing.” The messages returned are shown in Table 69.

Table 69
Unrecognized “comprehension required IE” treatment

Incoming message	Message returned
SETUP	RELEASE COMPLETE with cause 96
DISCONNECT	RELEASE with cause 96
RELEASE	RELEASE COMPLETE with cause 96
RELEASE COMPLETE	No message is returned (see note 1)
Other	STATUS with cause 96
Note 1: The message is treated as if it is received with cause 31 “Normal, unspecified.”	

Transit counter

The transit counter IE is defined as a codeset 4 IE instead of codeset 5. The transit counter functionality is considered to be a supplementary service.

Restart procedure

When a RESTART message with a restart IE coded “Channel indicated” is received with no Channel ID IE, the message is treated as if a mandatory IE is missing. A STATUS message is returned with cause 96, (mandatory IE missing).

Progress indicator

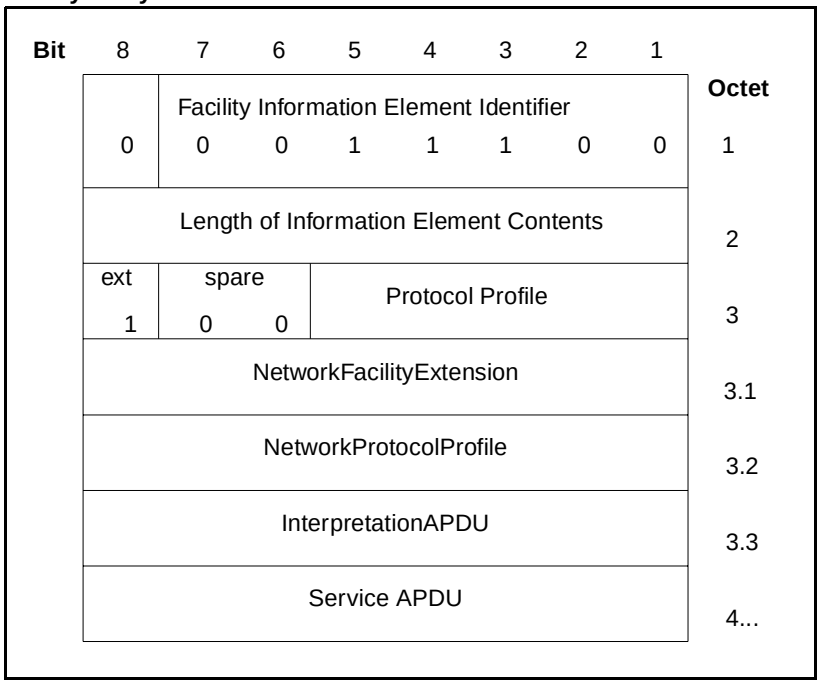
Progress indicators 15, 16, 17 and 18, defined in the European Computer Manufacturer’s Association (ECMA) coding are not defined for this interface.

QSIG GF Compliance Update

Facility IE coding

Figure 74 illustrates the layout of the Facility IE.

Figure 74
Facility IE layout



Protocol profile coding

Figure 70 illustrates three different examples of coding in the Protocol Profile.

Table 70
Protocol Profile Coding

Bits					
5	4	3	2	1	
1	0	0	0	1	ROSE
1	0	0	1	1	ACSE
1	1	1	1	1	Networking Extension
All other values are reserved.					

On transmission, the Meridian 1 codes the Protocol Profile as “Networking Extension.”

On reception, the Meridian 1 supports Protocol Profile coded as “ROSE” or “Networking Extension.”

Network Protocol Profile coding

The Network Protocol Profile is used to specify the Service APDU coding type. Since the Meridian 1 only supports ROSE (the default coding type), the Network Protocol Profile is always omitted.

NFE and interpretation coding

No change is introduced by this update in the coding of the NFE and of the interpretation APDU.

Service APDU coding

The Service APDU coding is service dependent. It is not affected by this update.

Operating parameters

The earlier version of QSIG is still available, to be used in networks where supplementary services are involved.

The ISDN QSIG-BC and QSIG-GF Compliance Update feature is not available on PRI 1.5 Mb links. These links are usually configured with ISO QSIG GF.

The following optional parts of the protocol are not supported by the ISDN QSIG-BC and QSIG-GF Compliance Update feature:

- Message segmentation
- Multi-rate
- Indication of the channel with a map in the Channel ID IE

There are two choices of PRI2 hardware for Option 51C, Option 61C, and Option 81C systems:

- PRI2 card (NT8D72) and MSDL card (NT6D80)
- Dual port DTI/PRI2 card (NTCK43) and either the Downloadable D-channel Daughterboard card (NTBK51) or the MSDL card (NT6D80)

These systems require the QPC775 (Release E) or the QPC471 Clock Controller card.

The hardware required for the Option 11C is:

- PRI2 card (NTBK50)
- Downloadable D-channel Daughterboard card (NTBK51)
- Clock Controller (NTAK20)

The hardware required for ISDN BRI is as follows:

- SILC card (NT6D70)
- MISP card (NT6D73) for Option 51C, Option 61C, and Option 81C systems
- MISP card (NTBK22) for the Option 11C system

Feature interactions

There are no feature interactions specified for this feature.

Feature packaging

The following software packages are required for ISDN PRI QSIG:

- ISDN Signaling (ISDN) package 145
- Primary Rate Access (PRA) package 146
- 2 Mbps PRI (PRI2) package 154
- International PRA (IPRA) package 202
- Multi-Purpose Serial Data Link (MSDL) package 222
- QSIG Interface (QSIG) package 263
- QSIG GF Transport (QSIGGF) package 305

The following software packages are required for ISL QSIG:

- ISDN Signaling (ISDN) package 145
- ISDN Signaling Link (ISL) package 147
- Multi-Purpose Serial Data Link (MSDL) package 222
- QSIG Interface (QSIG) package 263
- QSIG GF Transport (QSIGGF) package 305

The following software packages are required for ISDN BRIT QSIG:

- ISDN Signaling (ISDN) package 145
- ISDN Basic Rate Access (BRI) package 216
- Multi-Purpose Serial Data Link (MSDL) package 222
- ISDN BRI Trunk Access (BRIT) package 233
- QSIG Interface (QSIG) package 263
- QSIG GF Transport (QSIGGF) package 305

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 17 – Configure the updated interface type for the D-channel.

2 LD 16 – Configure the updated interface type for the trunk route.

LD 17 – Configure the updated interface type for the D-channel.

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	CFN	Configuration Record.
ADAN	CHG DCH X	Change D-Channel number.
...		

- IFC	ESGF ISGF	ETSI QSIG interface with GF platform. ISO QSIG interface with GF platform.
...		

LD 16 – Configure the updated interface type for the trunk route.

Prompt	Response	Description
REQ	CHG NEW	Change existing data. Add new data.
TYPE	RDB	Route Data Block.
CUST	xx	Customer number.
ROUT	0 - 511 0-127	Route Number. For Option 11C.
...		
DTRK	YES	Digital Trunk Type.
- DGTP	PRI BRI	PRI trunk. BRI trunk.
- IFC	ESGF ISGF	ETSI QSIG interface with GF platform. ISO QSIG interface with GF platform.
...		

Feature operation

There are no operating procedures specified for this feature.

ISDN QSIG Call Diversion Notification

Contents

The following are the topics in this section:

Regional material statement 949
Feature description 949
Calling Party's Notification 952
Called Party's Notification 953
Operating parameters 954
Feature interactions 955
Feature packaging 955
Feature implementation 956
Task summary list 956
Feature operation 966

Regional material statement

ISDN BRI trunking is not available in North America. Contact your system supplier or your Nortel Networks representative to verify support of this product in your area.

Feature description

ISDN QSIG Call Diversion Notification allows the Meridian 1 to provide notification to the originating calling party and forwarded-to (diverted) party when a call is forwarded over an ISDN QSIG private network. With this feature, call diversion is invoked by the following triggers:

- Call Forwarding Busy (CFB) - the called set is in use

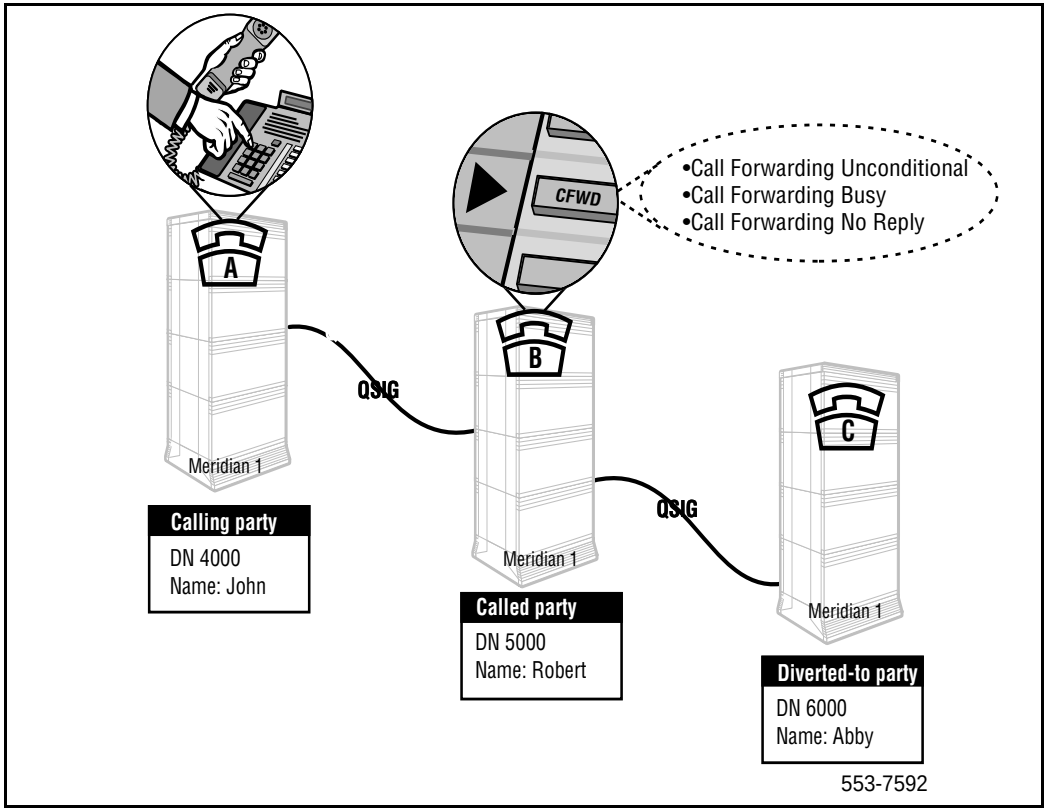
- Call Forwarding No Reply (CFNR) - the called set does not answer after a given number of rings
- Call Forwarding Unconditional (CFU) - the called set is forwarded as soon as the set is reached

With this feature, notification can be provided to the calling party and the forwarded-to (diverted) party that call diversion has occurred. When provisioned, call diversion notification is displayed on the calling party's set and on the forwarded-to (diverted) party's set according to the existing terminal display configuration.

Diversion notification provided to the calling and forwarded-to (diverted) party depends on the subscription options (Class of Service) configured on the called party's set. The called party can configure two diversion options. One Class of Service option is applicable to the calling party and the other option is applicable to the forwarded-to (diverted) party. These new Classes of Service determine if call diversion notification is provided to the calling party and the forwarded-to party and what type of diversion information these parties receive.

Figure 75 shows an example of a Call Diversion environment.

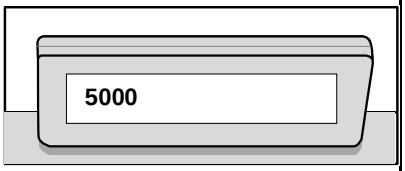
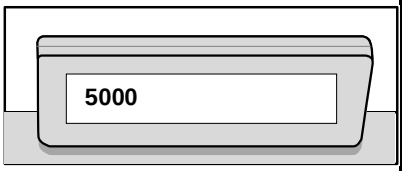
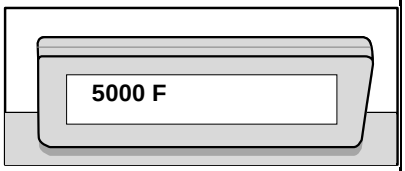
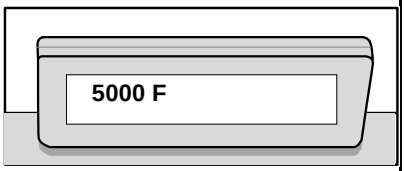
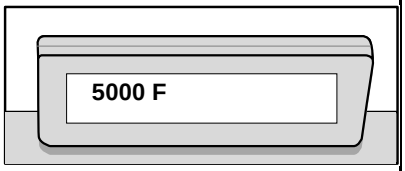
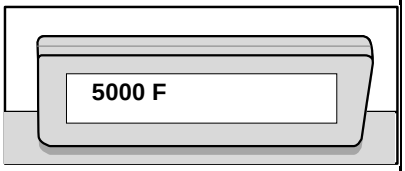
Figure 75
Call Diversion Environment



Calling Party's Notification

The calling party that originates the call receives notification of call diversion depending on the configuration of the called party's set. As shown in Table 71, the called party configures one of the three possible Classes of Service.

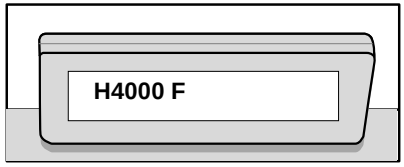
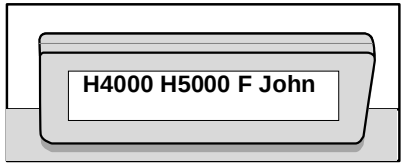
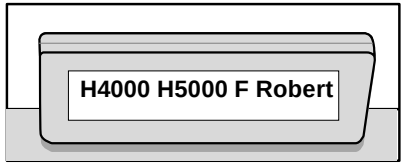
Table 71
Calling Party's Notification

Called Party's Diversion Subscription Options (Class of Service)	Calling Party's Display when call is forwarded.	Forwarded-to Party's Display
CLS = DNO1 No diversion notification provided to calling party.		
CLS = DNO2 Diversion notification provided **without** forwarded-to (diverted) party's number and name.		
CLS = DNO3 (default) Diversion notification provided **with** forwarded-to (diverted) party's number and name when available.		

Called Party's Notification

The forwarded-to (diverted) party receives notification of call diversion depending on the configuration of the called party's set. As shown in Table 72, the called party configures one of the two possible Classes of Service.

Table 72
Forwarded-to Party's Notification

Called Party's Diversion Subscription Options (Class of Service)	Forwarded-to Party's Display.	Forwarded-to Party's Class of Service
DNDN = No Called party's number and name **are not released** to the forwarded-to (diverted) party.		DNDD = Dialed Name Display Denied (default)
DNDY = Yes (default) Called party's number and name **are released** to forwarded-to (diverted) party.		DNDD = Dialed Name Display Denied (default)
DNDY = Yes (default) Called party's number and name **are released** to forwarded-to (diverted) party.		DNDA = Dialed Name Display Allowed

On the forwarded-to (diverted) party's set, the Dialed Name Display Allowed/Denied (DNDA/DNDD) Class of Service allows the forwarded-to (diverted) party to choose the name displayed after call diversion. If the forwarded-to (diverted) party configures a Dialed Name Display Allowed (DNDA) Class of Service their display shows one of the following:

- the original called party's name when available; or
- if the original called party's name is not available, the redirecting name when available; or
- if neither of the two previous names are available, then nothing is displayed.

If the forwarded-to (diverted) user has configured a Dialed Name Display Denied (DNDD) Class of Service then the calling party's name is displayed if available. Otherwise, nothing is displayed.

Operating parameters

A Meridian 1 user cannot remotely activate or deactivate QSIG Call Diversion Notification from either a Meridian 1 or on another third party Private Branch Exchange (PBX).

As per the current operation of the Call Forward features, the Meridian 1 does not provide any indication, such an LED, on the called party's set that call diversion has been activated.

The validity of the forwarding number is not supported. If an invalid forwarding directory number is dialed no verification is provided by the system.

The calling party is notified each time a call redirection occurs, provided this information is supplied by the network. If previous call diversion notification is provided, then it is replaced by last received. If call redirection occurs and no call redirection information is provided by the network, then any notification information that has previously been provided remains unchanged.

When a call redirection occurs no call diversion information is provided by the network. However, if a previous notification has been provided then the call diversion information remains unchanged.

The maximum allowable size of QSIG name information is 50 characters. With the Call Party Name Display feature, only 27 characters string length is supported. Accordingly, names processed by the Meridian 1 may be truncated.

Across a network, it is not possible to prevent reciprocal Call Forward from occurring. However, the capabilities of the Flexible Orbiting Prevention Timer and Total Redirection Count features can be used.

QSIG Call Diversion Notification requires Coordinated Dialing Plan (CDP) or Uniform Dialing Plan (UDP). Digit manipulation is not supported.

Interworkings with Meridian Customer Defined Network (MCDN) call redirection and QSIG Call Diversion Notification is not supported.

Interaction with Meridian Mail and this feature is not supported.

Feature interactions

There are no feature interactions associated with this feature.

Feature packaging

QSIG Call Diversion Notification is ISDN QSIG Supplementary Service - Call Completion (QSIG-SS) package 316 which has the following dependencies:

- Digit Display (DDSP) package 19
- Network Alternate Route Selection (NARS) package 58 (for Uniform Dialing Plan), or Coordinated Dialing Plan (CDP) package 59
- Calling Party Name Display (CPND) package 95
- QSIG Interface (QSIG) package 263
- ISDN QSIG-GF Transport (QSIG-GF) package 305

ISDN PRI QSIG Interface requires:

- Primary Rate Access (PRI) package 146
- 2.0 Mb Primary Rate Interface (PRI2) package 154

- International Primary Rate Access (IPRA) package 202
- Multipurpose Serial Data Link (MSDL) package 222

ISDN Basic Rate Interface Trunk Access (BRIT) QSIG Interface requires:

- Basic Rate Interface (BRI) package 216
- ISDN Basic Rate Interface Trunk Access (BRIT) package 233

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 17 – Configure or remove remote capabilities D-channel for QSIG Call Diversion Notification.

2 LD 16 – Configure Remote Capability for a route with QSIG Generic Functional Interface.

3 LD 10 – Configure QSIG Diversion Notification on analog (500/2500 type) telephones

4 LD 11 – Configure QSIG Diversion Notification on Meridian 1 proprietary telephones.

5 LD 27 – Configure Basic Rate Interface telephones

6 LD 95 – Modify Call Party Name Display data block

7 LD 95 – Define Name for telephones

8 LD 11 – Configure the name that is to be displayed on the Forwarded-to (diverted) Party's set

The QSIG Call Diversion Notification feature requires the configuration of one of the following call redirection features: Call Forward All Calls, Call Forward/Hunt Override Via Flexible Feature Codes, Call Forward Remote (Attendant and Networkwide), Call Forward No Answer/Flexible Call Forward No Answer, Call Forward No Answer Second Level, Call Forward Internal Calls and User Selectable Call Redirection. The implementation of these features is not modified.

Remote Capability Meanings

Table 73 indicates the remote capabilities meanings for both D-channel and BRI routes. When using Table 73 consider the following:

- Only nodes subject to be Originating, Served, Diverted or Rerouting nodes with respect to QSIG Call Diversion Notification need to have diversion remote capability configured. Transmit nodes pass the information transparently.
- When choosing the Operation Coding Choice, the interface type should be considered. When the QSIG interface used is ISO (IFC ISGF), operations are mostly coded with Integer Values. For ETSI interfaces (IFC ESGF), the operation coding depends on the standard version: the last ones are likely to use Integer Values, whereas some older ones may use Object Identifiers.

Only one remote capability allows the QSIG Diversion configuration on a D-channel/BRI route. This remote capability gathers the three following possibilities for the D-channel/BRI route:

1 coding of operations is sent to the remote switch, which can be coded as either as Object Identifier or as Integer Value. If coded as Object Identifier, the remote capability ends with an 'O', whereas for Integer Value, the remote capability ends with an 'I'. This means that remote capabilities explained below in 2 and 3 are defined twice.

2 sending of QSIG Diversion Notification Information to the remote switch: this information is sent only if the remote capability is of first or third type, i.e. DV1x or DV3x, where the x is either 'I' or 'O' as explained in 1.

3 treatment of Rerouting requests received from the remote switch: a rerouting request is only processed if the remote capability is of second or third type, i.e. DV2x or DV3x, where x is either 'I' or 'O' as explained above in 1.

Table 73
Remote Capability Meanings

Remote capability	Meaning for Operation Coding	Meaning for Notification Information	Meaning for Rerouting request
None of the following remote capabilities.	Not applicable (nothing sent)	Not sent	Not processed when received
DV1O	Sent coded as Object Identifier	Sent	Not processed when received
DV1I	Sent coded as Integer Value		

Table 73
Remote Capability Meanings

DV2O	Sent coded as Object Identifier	Not Sent	Processed when received
DV2I	Sent coded as Integer Value		
DV3O	Sent coded as Object Identifier	Sent	Processed when received
DV3I	Sent coded as Integer Value		

LD 17 – Configure or remove remote capabilities D-channel for QSIG Call Diversion Notification.

Prompt	Response	Description
REQ:	CHG	Change existing data.
TYPE:	ADAN	Action device and number.
ADAN	CHG DCH x	Configure new remote capabilities on D-channel x.
...		
IFC	xxxx	QSIG interface type where xxxx is: ESGF = interface ID for ETSI QSIG with GF capability. ISGF = Interface ID for ISO with GF capability.
...		
RLS	xx	Software release.
...		

RCAP		QSIG SS Call Diversion Notification remote capability. Configure sending of QSIG Diversion Notification Information, treatment of Rerouting request and coding of operations. If coded as Object Identifier, the remote capability ends with ‘O”, whereas for Integer Value, the remote capability ends with ‘I’. Only one remote capability is allowed. Refer to Table 1 for further information.
	DV1I	Diversion information is sent to remote switch.
	DV1O	Diversion information is sent to remote switch.
	DV2I	Rerouting requests from remote switch are processed. Rerouting requests from remote switch are processed.
	DV2O	Diversion information is sent to remote switch. Rerouting requests from remote switch are processed.
	DV3I	Diversion information is sent to remote switch.
	DV3O	Rerouting requests from remote switch are processed.
		Precede with ‘X’ to remove capability**.**

LD 16 – Configure Remote Capability for a route with QSIG Generic Functional Interface.

Prompt	**Response**	**Description**
REQ	CHG	Change existing data.
TYPE	RDB	Route Data Block.
CUST	xx	Customer number.
ROUT	0 - 511 0-127	Route Number. For Option 11C.
...		
IFC	xxxx	QSIG interface type where xxxx is: ESGF = interface ID for ETSI QSIG with GF capability. ISGF = Interface ID for ISO with GF capability.
...		

RCAP		QSIG SS Call Diversion Notification remote capability. Configure sending of QSIG Diversion Notification Information, treatment of Rerouting request and coding of operations. If coded as Object Identifier, the remote capability ends with 'O", whereas for Integer Value, the remote capability ends with 'I'. Only one remote capability is allowed. Refer to Table 1 for further information.
	DV1I	Diversion information is sent to remote switch.
	DV1O	Diversion information is sent to remote switch.
	DV2I	Rerouting requests from remote switch are processed.
	DV2O	Rerouting requests from remote switch are processed. Diversion information is sent to remote switch. Rerouting requests from remote switch are processed.
	DV3I	Diversion information is sent to remote switch.
	DV3O	Rerouting requests from remote switch are processed.
		Precede with 'X' to remove capability**.**

LD 10 – Configure QSIG Diversion Notification on analog (500/2500 type) telephones

Prompt	**Response**	**Description**
REQ:	NEW CHG	Add new data. Change existing data.
TYPE:	500	Telephone type.
...		
TN	l s c u c u	Terminal Number. For Option 11C.
...		
DN	x...x yyy	Directory Number and Calling Line Identification entry (Range is (0) - value entered for SIZE prompt in LD 15 minus one).
...		
- CPND	aaa	Calling Party Name Display where: NEW = Add data block. CHG = Change existing data block. OUT = Remove existing data block.

- -CPND_LANG	aaa	Calling Party Name Display Language where: (ROM) = Roman. KAT = Katakana.
- - NAME	aaaa bbbb	Calling Party Name Display Name where: First name Last name.
...		
CLS		QSIG Call Diversion Notification options for calling party.
	(DNO3) DNO1 DNO2	Notification with diverted-to party's number and name. No notification. Notification without diverted-to party's number and name.
		QSIG Call Diversion Notification options concerning forwarded- to party.
	(DNDY) DNDN	Notification with Called party's number and name. Notification without Called party's number and name.
	CNDA	Call Party Name Display Allowed
	CFXA	Call Forward to External DN Allowed.
	CFTA	Call Forward by Call Type Allowed.
	DDGA	Directory Number Display on other set Allowed.
	FNA	Call Forward No Answer Allowed.
	HTA	Hunting Allowed.
	NAMA	Name Display on other set Allowed or (Denied).

LD 11 – Configure QSIG Diversion Notification on Meridian 1 proprietary telephones.

Prompt	Response	Description
REQ:	NEW CHG	Add new data. Change existing data.
TYPE:	xxxx	Telephone type, where: xxxx = SL1, 2006, 2008, 2009, 2016, 2018, 2112, 2216, 2317, 2616 or 3000.
...		

TN	l s c u c u	Terminal Number. For Option 11C.
...		
FDN	x...x	Flexible Call Forward No Answer DN for an Internal Directory Number.
...		
CLS		QSIG Call Diversion Notification options for calling party.
	(DNO3)	Notification with diverted-to party's number and name.
	DNO1	No notification.
	DNO2	Notification without diverted-to party's number and name.
		QSIG Call Diversion Notification options concerning forwarded- to party.
	(DNDY)	Notification with Called party's number and name.
	DNDN	Notification without Called party's number and name.
	CNDA	Call Party Name Display Allowed
	CFXA	Call Forward to External DN Allowed.
	CFTA	Call Forward by Call Type Allowed.
	DDGA	Directory Number Display on other set Allowed.
	FNA	Call Forward No Answer Allowed.
	HTA	Hunting Allowed.
	NAMA	Name Display on other set Allowed or (Denied).
...		
RCO	(0) - 2	Ringing Cycle Option for Call Forward No Answer.
EFD	x...x	Call Forward No Answer Directory Number for external calls
...		
- CPND	aaa	Calling Party Name Display where: NEW = Add data block. CHG = Change existing data block. OUT = Remove existing data block.

- -CPND_LANG	aaa	Calling Party Name Display Language where: (ROM) = Roman. KAT = Katakana.
- - NAME	 aaaa bbbb	Calling Party Name Display Name where: First name Last name.

LD 27 – Configure Basic Rate Interface telephones

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	TSP	Terminal Service Profile.
DSL	l s c dsl	Digital Subscriber Loop address.
USID	x	User Service Identifier.
...		
DN	xxx...x	Directory Number associated with TSP (1 to 7 digits).
- CTI	VCE DTA	Call type where VCE = circuit switched voice and DTA = circuit switched data.
...		
FEAT	CFXA	Call Forward Allowed to external Directory Number.
FEAT	xxxx	QSIG Call Diversion Notification for calling party where xxxx: DNO1 = no notification DNO2 = notification without forwarded-to (diverted) party's number and name (DNO3) = notification with forwarded-to (diverted) party's number and name when available.

FEAT	xxxx	QSIG Call Diversion Notification for forwarded-to (diverted) party where xxxx: DNDN = no notification of called party's number and name notification (DNDY) = notification with called party's number and name when available (default).
SSRV_ETSI	aaa mmm nnn	ETSI Supplementary Service where: VCFW = Voice Call Forward and DCFW = Data Call Forward.

LD 95 – Modify Call Party Name Display data block

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	CPND	Call Party Name Display data block.
CUST	xx	Customer number.
...		
RESN	YES	Display Redirection reason allowed. (NO) = Display Redirection reason denied (default).
- CFWD	aaaa	Mnemonic for Call Forward All Call display. (F) = default
- CFNA	aaaa	Mnemonic for Call Forward No Answer display (N) = default.
- HUNT	aaaa	Mnemonic for Call Forward Busy display. (B) = default

LD 95 – Define Name for telephones

Prompt	Response	Description
REQ	NEW	Add new data.
TYPE	NAME	Name.
CUST	xx	Customer number.

...		
DN	x..x	Directory Number.
- NAME	a..a	Calling Party Name Display in ASCII characters.

LD 11 – Configure the name that is to be displayed on the Forwarded-to (diverted) Party's set

Prompt	Response	Description
REQ:	CHG	Change existing data.
TYPE:	xxxx	Telephone type, where: xxxx = SL1, 2006, 2008, 2009, 2016, 2018, 2112, 2216, 2317, 2616 or 3000.
TN	l s c u c u	Terminal Number. For Option 11C.
...		
CLS	DNDA	Dialed Name Display Allowed. (DNDD)= Dialed Name Display Denied (default).

Note: LD 81 may be used to print counting or listing queries pertaining to the new Classes of Service, by entering CNT or LST against the REQ prompt, and the appropriate COS against the FEAT prompt.

Note: LD 83 may be used may be used to print the new Classes of Service in the TN blocks, by entering TNB against the REQ prompt, and the appropriate COS against the CLS prompt.

Feature operation

No specific operating procedures are required to use this feature.

ISDN QSIG Call Diversion Notification Enhancements

Contents

The following are the topics in this section:

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Regional material statement

ISDN BRI trunking is not available in North America. Contact your system supplier or your Nortel Networks representative to verify support of this product in your area.

Feature description

The ISDN QSIG Call Diversion Notification feature allows the Meridian 1 to provide notification to the originating calling party and forwarded-to (diverted) party when a call is forwarded over an ISDN QSIG private network. With this feature, call diversion is invoked by the following triggers:

- Call Forwarding Busy (CFB) - the called set is in use
- Call Forwarding No Reply (CFNR) - the called set does not answer after a given number of rings
- Call Forwarding Unconditional (CFU) - the called set is forwarded as soon as the set is reached

With this feature, notification can be provided to the calling party and the forwarded-to (diverted) party that call diversion has occurred. When provisioned, call diversion notification is displayed on the calling party's set and on the forwarded-to (diverted) party's set according to the existing terminal display configuration.

Diversion notification provided to the calling and forwarded-to (diverted) party depends on the subscription options (Class of Service) configured on the called party's set. The called party can configure two diversion options. One Class of Service option is applicable to the calling party and the other option is applicable to the forwarded-to (diverted) party. These Classes of Service determine if call diversion notification is provided to the calling party and the forwarded-to party and what type of diversion information these parties receive.

The QSIG Call Diversion Notification service is provided across an ISDN QSIG network using the QSIG Generic Functional (GF) protocol transport platform.

With this enhancement, the ISDN QSIG Call Diversion Notification Enhancements feature allows the QSIG Call Diversion Notification functionality to be also supported over a QSIG/Meridian Customer Defined Network (MCDN) and a QSIG/Digital Private Signaling System No.1 (DPNSS1) network, as well as a QSIG network. As per the existing implementation, the QSIG Call Diversion Notification Enhancements feature is supported on ISDN Primary Rate Interface and ISDN Basic Rate Interface Trunking (BRIT) interfaces.

The notification of the originating set and the diverted-to set now depends on the type of signaling protocol that is in play (QSIG, DPNSS1, or MCDN), at what stage of the call establishment that the diversion takes place, and the user's subscription option.

Operating parameters

There are no operating parameters associated with this feature.

Determination of the rerouting node

The determination of the rerouting node depends on the type of diversion that is configured for the node, either Call Diversion by Rerouting or Call Diversion by Forward Switching.

If the Forward Switching method is implemented (call diversion is generated by the Meridian 1or another third-party PBX also using the Forward Switching method), the rerouting node is the served node. If the Call Diversion by Rerouting method is implemented (a third-party switch using the Rerouting method generates a diversion), the rerouting node is the originating node.

The Forward Switching method is the one presently implemented on Meridian 1. It performs the diversion by joining together the first connection from the originating user's node to the served user's node, and the second new connection from the served user's node to the diverted-to user's node. In fact, the rerouting node is the served user's node.

Notifications rules

This section describes Originating and Diverted-to user's notification rules, for single as well as multiple diversions in a pure QSIG environment.

Single Diversion

Originating and Diverted-to user's Notifications are detailed for the following scenario: "Station A calls Station B. Station B has activated CFU, CFB or CFNR to Station C. Station C answers".

Originating user's notification rules

Diversion Reason Notification rules:

- This reason is displayed or not on the originating user's set (as soon as Diversion Notification information is received from the served node) according to the served user's Subscription option (see Table 74 on page 971).

Diverted-to Number Notification rules:

- The diverted-to number (received in the Diversion Notification information delivered by the served node) is displayed on the originating user's set:

  — if the received presentation information (received in the Diversion Notification information issued from the diverted-to node) indicates that presentation is allowed.

  — if the served user's subscription option (received within Diversion Notification information from the served node) allows it (see Table 74 on page 971).

Diverted-to Name Notification rules:

- The diverted-to name, when available (as optionally received as part of the Diversion Notification information delivered by the diverted-to node), is displayed on the originating user's set:

  — if the intrinsic name presentation (received in the Diversion Notification information issued from the diverted-to node) indicates that presentation is allowed.

  — if the served user's subscription option (received within Diversion Notification information from the served node) allows it (see Table 74 on page 971).

  Note that DNDA/DNDD functionality has no impact on the originating user's notification.

When both originating and served users are on the same node, the existing Meridian 1 treatment is still applicable, which is that the served user's subscription options have no impact on the originating user notification.

When both originating and diverted-to users are on the same Meridian 1 node, and diversion is performed by the Rerouting method, then the served user's subscription options are effective for the originating user notification only before the diverted-to user answers, but no name is provided. As soon as the diverted-to user answers, then the originating user receives full notification (reason, diverted-to user's number and name), as per the served user's subscription option.

Table 74 sums up originating user's Notification according rules, according to the served user's Subscription options.

Table 74
Originating user's notification versus served user's Subscription option

	Originating user's display	
Served user's Subscription option: "Calling user receives notification that the call has been diverted"	after receipt of served user's diversion notification information	after receipt of diverted-to user's diversion notification information
No	5000	5000
Yes without diverted-to number and name	5000 F	5000 F
Yes with diverted-to number and name when available	5000 F	5000 H6000 F Cathy

Diverted-to user's notification rules

Diversion Reason Notification rules:

- The reason is displayed on the diverted-to user's set (as soon as Diversion Notification Information is received from the served node).

Served Number Notification rules:

- The served user's number (the originally-called number) is displayed or not on the diverted-to user's set, according to the served user's Subscription option (see Table 75 on page 973). If the served user's Subscription option is to not release the calling party name/number to the diverted-to user, the served user's number may be either displayed with dashes (if received with a restricted presentation) or not displayed at all (if no served user's number is received).

Served Name Notification rules:

- The functionality DNDA/DNDD allows the diverted-to user to choose the name to be displayed after diversion has taken place:

  — if the diverted-to set has a DNDA class of service, then the diverted-to user's set displays one of the following:
  - the original called name when available (as optionally received from the served user's node, depending on the previous served users's Subscription Option), or
  - if the original called name is not available, the redirecting name when available (as optionally received from the served user's node, depending on the served user's Subscription Option), or
  - nothing if none of the two previous names is available.

  — if the diverted-to set has a DNDD class of service, then the calling user's name is displayed if available, otherwise nothing is displayed.

When both served and diverted-to users are on the same node, the present Meridian 1 treatment applies, that is, the served user's subscription options have no impact on the diverted-to user notification.

When both the originating and diverted-to users are on the same Meridian 1 node and diversion is performed by the Rerouting method, then served user's subscription options have no impact on the diverted-to user notification. In this case, DNDA functionality is not supported.

Table 75 sums up the diverted-to user's Notification rules, according to the served user's Subscription options and the diverted-to user's class of service DNDA/DNDD.

Note that, in the case presented in the example, the Originating user name is Abby, with a DN of 4000. The Served user name is Bobby, with a DN of 5000. The Diverted-to user name is Cathy, with a DN of 6000.

Table 75
Diverted-to user's notification versus served user's Subscription option and diverted-to user class of service for single diversion

Served user's Subscription option: "Served user releases the number/name to the diverted-to user"	Diverted-to user's display (after receipt of served user's diversion notification information) depending on the diverted-to user class of service:	
	DNDD	DNDA
No	H4000 H---- F Abby OR H4000 F Abby	H4000 H---- F OR H4000 F
Yes	H4000 H5000 F Abby	H4000 H5000 F Bobby

Multiple diversions

Originating and Diverted-to user's Notifications are detailed for the following scenario: "Station A calls Station B. Station B has activated CFU, CFB or CFNR to Station C. Station C has activated diversion to Station D, which itself has activated diversion to Station E. Station E has activated diversion to Station F. Station F answers".

Originating user's notification rules

Diversion Reason Notification rules:

- The same rules apply as per the single diversion case (refer to page 969). The last diversion reason will replace the previous one.

Diverted-to Number Notification rules

The diverted-to number (as received in the last Diversion Notification information message issued from the last served node) is presented to the calling user if all of the following conditions apply:

- all previously Diversion Notifications information messages received at the originating node contain a subscription option with a value of "Yes with diverted-to number/name", and
- any previously Diversion Notification information message issued from the diverted-to node contain a presentation indicator that allows presentation.

The last diverted-to number will replace the previous one.

Diverted-to Name Notification rules

The diverted-to name, when available (as optionally received within the Diversion Notification information message delivered by the diverted-to node), is presented to the calling user if all of the following conditions apply:

- all previously Diversion Notifications information messages received at the originating node include a subscription option with a value of "Yes with diverted-to number/name", and
- the intrinsic name presentation is allowed.

The last diverted-to name will replace the previous one. Note that DNDA/DNDD functionality has no impact on the originating user's notification.

Diverted-to user's notification rules

Diversion Reason Notification rules:

- The same rules apply as per the single diversion case (refer to page 970).

Served Number Notification rules:

- Either the originally-called number (as soon as a Diversion Notification information message is received from the last served node) is displayed or not on the diverted-to user's set, according to the first served user's Subscription option.

Served Name Notification rules:

- The same rules, including the DNDA/DNDD functionality, apply as for the single diversion case (refer to page 972).

Table 76 sums up a multiple diversion case considering the different parties' Subscription option, and the diverted-to user class of service.

Note that, in the case presented in the example, the Originating user name is Abby, with a DN of 4000. The first Served user name is Bobby, with a DN of 5001. The second Served user name is Billy, with a DN of 5002. The Diverted-to user name is Cathy, with a DN of 6000.

Table 76
Diverted-to user's notification versus served user's Subscription option and diverted-to user class of service for multiple diversions (Part 1 of 2)

Served users' Subscription option: "Served user releases the number/name to the diverted-to user"		Diverted-to user's display (after receipt of diversion notification information) depending on the diverted-to user class of service:	
Bobby	Billy	DNDD	DNDA
No	No	H4000 H---- F Abby OR H4000 F Abby	H4000 H---- F OR H4000 F

Table 76
Diverted-to user's notification versus served user's Subscription option and diverted-to user class of service for multiple diversions (Part 2 of 2)

Yes	No	H4000 H5001 F Abby	H4000 H5001 F Bobby
No	Yes	H4000 H---- F Abby OR H4000 F Abby	H4000 H---- F Billy OR H4000 F Billy
Yes	Yes	H4000 H5001 F Abby	H4000 H5001 F Bobby

Feature interactions

Call Forward by call type

This feature allows to perform CFNA or Hunt to a different DN (FDN/EFD or HUNT/EHT) whether the call is internal or external.

This feature is supported by QSIG Diversion. The definition of an 'internal call' is not modified by the introduction of the QSIG Call Diversion Enhancements feature. An ISDN trunk call using private numbering is considered internal (note that no attempt is made to determine the real originating party with QSIG, only the type of numbering plan for the QSIG call is used).

Call waiting redirection

The Call Waiting Redirection (CWTR) feature allows unanswered calls given Call Waiting treatment to receive call redirection via Call Forward No Answer (CFNA) for the active set. An unanswered call receiving Call Waiting treatment is redirected to the active set's CFNA DN after the expiration of the customer data block defined CFNA timer selected for that set. This redirected call is treated as an unanswered call by the CFNA DN (the call receives messaging services such as Meridian Mail, Voice Mail, and Message Centers).

As this feature consists in a CFNA treatment, QSIG Call Diversion Notification feature handles it as a usual CFNA.

Call Forward Subscription Option

The behavior of the Call Forward Subscription Option is not changed. The QSIG Call Diversion Notification Subscription Options are defined as Classes of Service, but the active one will always be the Served User's Subscription Option, independently of the OPT overlay configuration (CFO/CFF).

Phantom TN

A Phantom TN can not be remotely activated, deactivated or interrogated through QSIG.

When a Phantom TN is Call Forwarded, the QSIG Diversion Notification is handled as if the Phantom TN was a normal DN.

Call Forward to Trunk Access Code

The CFTA prompt in LD 15, the Customer Data Block, is used to allow or disallow a Call Forward Trunk Access Code to be assigned to Call Forward All Calls DID calls.

Since QSIG Call Diversion is only supported on CDP or UDP dialing plans, it cannot be activated by CFTA.

Flexible Orbiting Prevention Timer

The Flexible Orbiting Prevention Time is supported on QSIG Diversion. However, since it limits the number of diversions that can be performed by a set in a given time, it is recommended that the Total Redirection Count capability be used instead.

Call Forward/Hunt Override

This feature is not supported on QSIG Diversion. A Meridian 1 user can neither originate nor receive a call over a QSIG link via Call Forward/Hunt Override. At gateways between QSIG and MCDN, this information is lost.

Access restrictions/trunk group access restrictions

Access restrictions are checked on the served node. This means that QSIG Diversion is not performed if the served user is not able to access the route to the diverted-to node.

Dialing plans

ISDN QSIG GF transport platform supports both the ISO QSIG GF specification and the ETSI QSIG GF specification. The same numbering plans and types of numbers supported by QSIG basic call are also supported by ISDN QSIG GF transport for any DN address translation required. They are summarized below:

E.164 Numbering Plan:

- Unknown
- International Number
- National Number
- Subscriber Number

Private Numbering Plan:

- Unknown
- ESN LOC (level 1 regional number)
- CDP (local number)

Unknown Numbering Plan:

- Same as for QSIG basic call. An Unknown Numbering Plan is treated as a Private numbering plan, with an ‘unknown’ type of number.

Meridian Link

Present Call Indication

A Present Call Indication message contents an IE called “Call Type”, which contains Diversion information about the incoming call. In case of a QSIG Diverted incoming call, this field is updated.

Unsolicited Status Message

When a set stops ringing because Call Forward No Reply has been applied to a QSIG call, an Unsolicited Status Message is sent to Meridian Link.

Meridian Mail

A QSIG call diverted to Meridian Mail may access the different Meridian Mail functionalities (message reception, mailbox interrogation). However, as no other information is provided to Meridian Mail, the different functionalities accessed through QSIG are only partially supported.

Call Completion to a Busy Subscriber

Call Forward Unconditional and Call Forward Busy

If Call Completion to a Busy Subscriber (CCBS) is to be invoked against a busy diverted-to user, the originating PINX stores the diverted-to number issued by the served PINX in order to use it for further CCBS treatments, without any manipulation.

Call Forward Unconditional (CFU) and Call Forward Busy (CFB) take precedence over CCBS.

Call Completion on No Reply

Call Forward Unconditional, Call Forward Busy, and Call Forward No Reply

If Call Completion on No Reply (CCNR) is to be invoked against a diverted-to user who does not answer, the originating PINX stores the diverted-to number issued by the served PINX in order to use it for further CCNR treatments, without any manipulation.

Call Forward No Reply (CFNR) takes precedence over CCNR.

QSIG Name Display Supplementary Services

Calling Name

After a QSIG Diversion takes place, and Call Diversion Notification information is received at the diverted-to node, the calling name is displayed on the diverted-to user's set only if this set has a DNDD class of service. If the diverted-to user's set has a DNDA class of service, another name or nothing is displayed.

Alerting/Connected Name

When both names from a QSIG Name Display Service and a QSIG Diversion Notification are included in a same message, the name from the QSIG Name Display Service will be ignored. Note that these names should be the same.

If a name, either from QSIG Name Display Service and QSIG Diversion Notification, is received, it will be displayed only if no subsequent subscription option forbids it.

QSIG Path Replacement

QSIG Path Replacement can be triggered after QSIG Diversion has been applied. As QSIG Diversion has its own optimization method (diversion by Rerouting), an IE indicating the method used is sent by the Meridian 1 during QSIG Diversion towards the diverted-to node. At the diverted-to Meridian 1 node, upon receipt of this IE, QSIG Path Replacement should only be started if diversion has not already optimized the call.

QSIG Call Transfer

There is no interaction when Station A and Station B are connected after a diversion, and then Station B transfers the call to Station C.

Station A and Station B are connected. Station B transfers the call to Station C, who then diverts the call to Station D. The notification depends on when Station B completes the transfer. If the transfer is completed before the diversion occurs, then the two services do not interact. The final notification is given by the Call Diversion Notification. If the diversion is initiated before the transfer has been completed, then the final notification depends on the transfer notification rules.

QSIG Alternate Routing

When a QSIG Alternate Routing is performed, the Facility IE sent with the setup message are not re-sent. Therefore, the diverted-to user does not receive the DLI2 information and is not notified that a diversion occurred.

Preventing Reciprocal Call Forward

Configuring the Preventing Reciprocal Call Forward Allowed (PVCA) option in LD 15 prevents Call Forward looping. A set that has been call forwarded to another set, will not have the same call-forwarded back to it.

This functionality is not supported across a QSIG network.

ISDN BRI Supplementary Services - ETSI Call Forward Unconditional

This feature implements the ETSI BRI Call Forward Unconditional feature, which allows a BRI set to activate Call Forward Unconditional. Two Call Forward DNs can be configured, one for voice and one for data.

A BRI set, as a served user, has the subscription option choices to notify both originating and diverted-to parties.

> ***Note:*** If the originating or diverted-to set is a BRI set, notification information is provided to this set, but the treatment by the set is subject to the manufacturer's implementation.

Attendant and Network Wide - Remote Call Forward

The Attendant and Network Wide- Remote Call Forward feature expands the set based Remote Call Forward functionality to apply across an MCDN ISDN network, and to allow Remote Call Forward for a set to be activated from an attendant.

This functionality cannot be used to activate QSIG Call Diversion.

Total Redirection Count

The Total Redirection Count (TRCL) prompt in LD 15 allows the maximum number of redirections for a customer to be defined between 1 and 7 (0 by default). The counter is incremented each time the call is diverted by Call Forward All Calls, Hunt, Call Forward No Answer, or Call Forward Busy, in an MCDN environment, whether on-node or off-node. The counter is reset when the call is answered or enters the attendant queue.

This feature is supported by QSIG, which transports the equivalent information.

Note that this feature is an available solution for avoiding infinite diversion loops, since Preventing Reciprocal Call Forward is not supported network-wide.

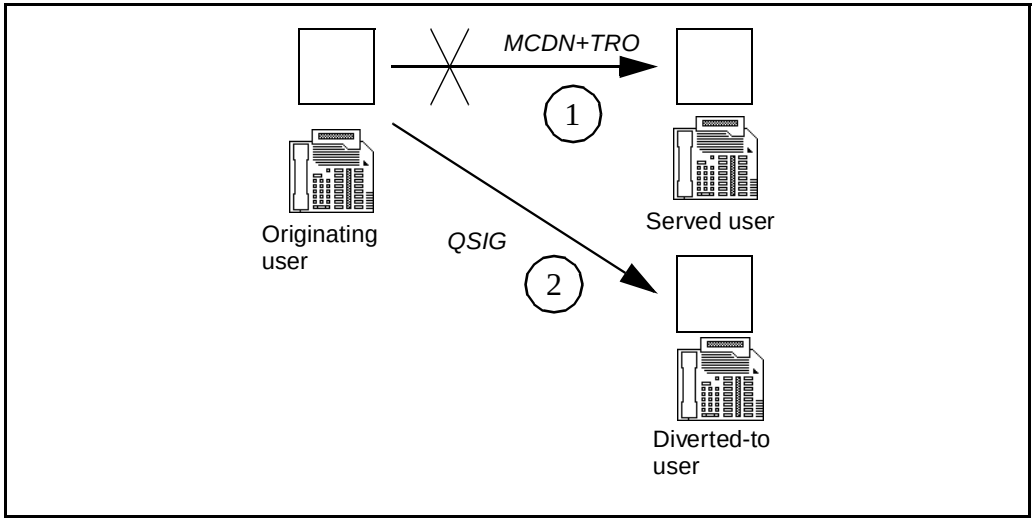
MCDN Trunk Route Optimization

Consider the case presented in Figure 76 on page 983.

For Call Forward No Answer (CFNA), call (1) is cleared before call (2) starts, which is not the usual mechanism for full QSIG CFNA.

Diversion Notification Information messages are sent from originating node to the diverted-to node. As the Served User's Subscription Option is not known (as well as the name in certain conditions), it is assumed to be "Served user releases the number/name to the diverted-to user: no". As a result, Diversion Notification Information messages provided in this case only contain the diversion counter, diversion reason and eventually the original reason for diversion.

Figure 76
Call from MCDN TRO Diverted to QSIG



MCDN Trunk Route Optimization is blocked on MCDN calls due to the Rerouting method used by QSIG Diversion on No Reply, as far as the original call being kept by the originating PINX to eventually be restored for further treatment. This case arises if the diverted-to user activates TRO before alerting, that is, if Call Forwarded All Calls has been activated against the diverted-to user.

MCDN Trunk Anti Tromboning (TAT)

As the MCDN Trunk Anti Tromboning feature is activated once the call is established, there is no interaction between this feature and QSIG Call Diversion Notification.

ISDN Call Connection Limitations

QSIG Diversion is included in the Call Redirection Threshold, as part of the ISDN Call Connection Limitations feature.

Timed Reminder Recall

In case of QSIG Diversion on No Reply by the Rerouting method, if the original call is under Slow Answer Recall Timing, then the new call resulting from QSIG Diversion is also timed for Slow Answer Recall. This applies if the new diversion call is over an ETSI QSIG link, or to a local analog (500/2500) set or Meridian proprietary set, but not to a BRI set.

The timer applied to the new diversion call is the remaining timer of the original call at the time of diversion.

Feature packaging

The following packages are required for the QSIG Call Diversion Notification Enhancements feature:

- Coordinated Dialing Plan (CDP) package 59, **or**, if the Uniform Dialing Plan is used, **either** Network Alternate Route Selection (NARS) package 58 **or** Basic Alternate Route Selection (BARS) package 57
- Integrated Services Digital Network (ISDN) package 145
- Primary Rate Access (PRI) package 146
- 2.0 Mbps Primary Rate Access (PRI2) package 154
- International Primary Rate Access (IPRA) package 202

- Multi-purpose Serial Data Link (MSDL) package 222
- Q-reference Signaling Point Interface (QSIG) package 263
- QSIG Generic Functional Protocol Transport (QSIG-GF) package 305
- Q-reference Signaling Point Interface Supplementary Services (QSIG-SS) package 316

For ISDN Basic Rate Interface Trunking (BRIT), the following additional packages are required:

- ISDN Basic rate Access (BRI) 216
- ISDN Basic Rate Trunk Access (BRIT) package 233

For a QSIG/DPNSS1 Gateway, the following additional packages are required:

- Integrated Digital Access (IDA) package 122
- Digital Private Networking Signaling System No. 1 (DPNSS) 123
- DPNSS Network Services (DNWK) package 231

For notification display, the following additional packages are required:

- Digit Display (DDSP) 19
- Call Party Name Display (CPND) package 95

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 17 – Configure or remove remote capabilities D-Channel for QSIG Call Diversion Notification.

2 LD 10 – Configure QSIG Diversion Notification Class of Service, on analog (500/2500 type) sets.

3 LD 11 – Configure QSIG Diversion Notification Class of Service, on Meridian 1 proprietary sets.

4 LD 95 – Configure the QSIF Call Diversion Notification mnemonics, for Call Forward All Calls, Call Forward No Answer, and Call Forward Busy, in the Call Party Name Display data block.

5 LD 95 – Define a Calling Party Name to be displayed on a receiving set.

6 LD 11 – On a Meridian proprietary set, configure whether or not the name of the originally-called party is to be displayed on the diverted-to set.

7 LD 16 – Configure the QSIG Call Diversion Notification Remote Capability for a BRI route with QSIG Generic Functional Interface.

8 LD 27 – Configure the Terminal Service Profile (TSP), to implement the QSIG Call Diversion options on BRI sets.

Remote Capability Meanings, for PRI D-Channels and BRI routes

Table 77 indicates the remote capabilities meanings for both PRI2 D-Channels and BRI routes. When using Table 77 consider the following:

- Only nodes subject to be Originating, Served, Diverted or Rerouting nodes with respect to QSIG Call Diversion Notification need to have diversion remote capability configured. Transmit nodes pass the information transparently.
- When choosing the Operation Coding Choice, the interface type should be considered. When the QSIG interface used is ISO (IFC ISGF), operations are mostly coded with Integer Values. For ETSI interfaces (IFC ESGF), the operation coding depends on the standard version: the last ones are likely to use Integer Values, whereas some older ones may use Object Identifiers.

Only one remote capability allows the QSIG Diversion configuration on a D-Channel/BRI route. This remote capability gathers the three following possibilities for the D-Channel/BRI route:

1 coding of operations is sent to the remote switch, which can be coded as either as Object Identifier or as Integer Value. If coded as Object Identifier, the remote capability ends with an 'O', whereas for Integer Value, the remote capability ends with an 'I'. This means that remote capabilities explained below in 2 and 3 are defined twice.

2 sending of QSIG Diversion Notification Information to the remote switch: this information is sent only if the remote capability is of first or third type, i.e. DV1x or DV3x, where the x is either 'I' or 'O' as explained in 1.

3 treatment of Rerouting requests received from the remote switch: a rerouting request is only processed if the remote capability is of second or third type, i.e. DV2x or DV3x, where x is either 'I' or 'O' as explained above in 1.

Table 77
Remote Capability Meanings (Part 1 of 2)

Remote capability	**Meaning for Operation Coding**	**Meaning for Notification Information**	Meaning for Rerouting request
None of the following remote capabilities.	Not applicable (nothing sent)	Not sent	Not processed when received
DV1O	Sent coded as Object Identifier	Sent	Not processed when received
DV1I	Sent coded as Integer Value		

Table 77
Remote Capability Meanings (Part 2 of 2)

DV2O	Sent coded as Object Identifier	Not Sent	Processed when received
DV2I	Sent coded as Integer Value		
DV3O	Sent coded as Object Identifier	Sent	Processed when received
DV3I	Sent coded as Integer Value		

ISDN PRI implementation procedures

- Configure the QSIG Call Diversion Notification emote Capability for the associated D-Channel, using LD 17.
- Configure QSIG Diversion Notification Class of Service, on analog (500/2500 type) sets, using LD 10.
- Configure QSIG Diversion Notification Class of Service, on Meridian proprietary sets, using LD 11.
- Configure the QSIF Call Diversion Notification mnemonics, for Call Forward All Calls, Call Forward No Answer, and Call Forward Busy, using LD 95.
- Define a Calling Party Name Display name string for a set, using LD 95.
- On a Meridian proprietary set, configure whether or not the name of the originally-called party is to be displayed on the set, if is a diverted-to set, using LD 11.

ISDN BRIT implementation procedures

- Configure the QSIG Call Diversion Notification Remote Capability for a BRI route with QSIG Generic Functional Interface, using LD 16.
- Configure the Terminal Service Profile (TSP), to implement the QSIG Call Diversion options on BRI sets, using LD 27.

ISDN PRI implementation

LD 17 – Configure or remove remote capabilities D-Channel for QSIG Call Diversion Notification.

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	ADAN	Action Device and Number.
- ADAN	NEW DCH xx	Add a D-Channel on port 0-63 (Options 51C-81C).
	NEW DCH xx	Add a D-Channel on port 0-14 (Option 11C).
...		
- IFC	ESGF ISGF	ETSI QSIG interface with GF platform. ISO QSIG interface with GF platform.
...		
RLS	xx	Software release.
...		

RCAP		QSIG SS Call Diversion Notification remote capability. Configure sending of QSIG Diversion Notification Information, treatment of Rerouting request and coding of operations. If coded as Object Identifier, the remote capability ends with 'O", whereas for Integer Value, the remote capability ends with 'I'. Only one remote capability is allowed. Refer to Table 1 for further information.
	DV1I	Diversion information is sent to remote switch.
	DV1O	Diversion information is sent to remote switch.
	DV2I	Rerouting requests from remote switch are processed. Rerouting requests from remote switch are processed.
	DV2O	Diversion information is sent to remote switch. Rerouting requests from remote switch are processed.
	DV3I	Diversion information is sent to remote switch.
	DV3O	Rerouting requests from remote switch are processed.
		Precede with 'X' to remove capability, **but do not specify the coding type**. For example, XDV3 or XDV1 (and not XDV3I or XDV1O).

LD 10 – Configure QSIG Diversion Notification Class of Service, on analog (500/2500 type) sets.

Prompt	**Response**	**Description**
REQ:	NEW CHG	Add new data. Change existing data.
TYPE:	500	Set type.
...		
TN		Terminal Number, for Options 51C-81C.
	l s c u	l = loop, s = shelf, c = card, u = unit.
		Terminal Number for Option 11C.
	c u	c = card, u = unit.
...		
DN	xx...x yyy	Directory Number and Calling Line Identification entry (yyy range is (0) - value entered for SIZE prompt in LD 15 minus one).
...		

- CPND	aaa	Calling Party Name Display where aaa can be: NEW = Add data block. CHG = Change existing data block. OUT = Remove existing data block.
- -CPND_LANG	aaa	Calling Party Name Display Language where: (ROM) = Roman. KAT = Katakana.
- - NAME	 aaaa bbbb	Calling Party Name Display Name where: aaaa = First name bbbb = Last name.
...		
CLS	 (DNO3) DNO1 DNO2	QSIG Call Diversion Notification options for calling party. Notification with diverted-to party's number and name. No notification. Notification without diverted-to party's number and name.
	  (DNDY) DNDN	QSIG Call Diversion Notification options for diverted-to party. DNDY = Notification with called party's number and name. DNDN = Notification without called party's number and name.

LD 11 – Configure QSIG Diversion Notification Class of Service, on Meridian 1 proprietary sets.

Prompt	**Response**	**Description**
REQ:	NEW CHG	Add new data. Change existing data.
TYPE:	 xxxx	Set type, where: xxxx = SL1, 2006, 2008, 2009, 2016, 2018, 2112, 2216, 2317, 2616 or 3000.
...		
TN	 l s c u c u	Terminal Number, for Options 51C-81C. l = loop, s = shelf, c = card, u = unit. Terminal Number for Option 11C. c = card, u = unit.

...		
FDN	x...x	Flexible Call Forward No Answer DN for an Internal Directory Number.
...		
CLS		QSIG Call Diversion Notification options for calling party.
	(DNO3)	Notification with diverted-to party's number and name.
	DNO1	No notification.
	DNO2	Notification without diverted-to party's number and name.
		QSIG Call Diversion Notification options for diverted-to party.
	(DNDY)	Notification with called party's number and name.
	DNDN	Notification without called party's number and name.
...		
- CPND	aaa	Calling Party Name Display where aaa can be: NEW = Add data block. CHG = Change existing data block. OUT = Remove existing data block.
- -CPND_LANG	aaa	Calling Party Name Display Language where aaa can be: (ROM) = Roman. KAT = Katakana.
- - NAME		Calling Party Name Display Name where:
	aaaa	aaaa = first name
	bbbb	bbbb = last name.

LD 95 – Configure the QSIF Call Diversion Notification mnemonics, for Call Forward All Calls, Call Forward No Answer, and Call Forward Busy, in the Call Party Name Display data block.

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	CPND	Call Party Name Display data block.

CUST	xx	Customer number, as defined in LD 15. xx = 0-99 for Options 51C-81C. xx = 0-31 for Option 11C.
...		
RESN	YES	Display Redirection reason allowed. (NO) = Display Redirection reason denied (default).
- CFWD	aaaa	Mnemonic for Call Forward All Call display. (F) = default
- CFNA	aaaa	Mnemonic for Call Forward No Answer display (N) = default.
- HUNT	aaaa	Mnemonic for Call Forward Busy display. (B) = default

LD 95 – Define a Calling Party Name to be displayed on a receiving set.

Prompt	**Response**	**Description**
REQ	NEW	Add new data.
TYPE	NAME	Name.
CUST	xx	Customer number, as defined in LD 15. xx = 0-99 for Options 51C-81C. xx = 0-31 for Option 11C.
...		
DN	x..x	Directory Number.
- NAME	a..a	Calling Party Name Display in ASCII characters.

LD 11 – On a Meridian proprietary set, configure whether or not the name of the originally-called party is to be displayed on the diverted-to set.

Prompt	**Response**	**Description**
REQ:	CHG	Change existing data.

TYPE:	xxxx	Telephone type, where: xxxx = SL1, 2006, 2008, 2009, 2016, 2018, 2112, 2216, 2317, 2616 or 3000.
TN	l s c u	Terminal Number, for Options 51C-81C. l = loop, s = shelf, c = card, u = unit.
	c u	Terminal Number for Option 11C. c = card, u = unit.
...		
CLS	(DNDD)	DNDD = Dialed Name Display Denied (the name of the originally-dialed party is not displayed on the set).
	DNDA	DNDA = Dialed Name Display Allowed (the name of the originally-dialed party is displayed on the set).

Note 1: LD 81 may be used to print counting or listing queries pertaining to the new Classes of Service, by entering CNT or LST against the REQ prompt, and the appropriate COS against the FEAT prompt.

Note 2: LD 83 may be used to print the new Classes of Service in the TN blocks, by entering TNB against the REQ prompt, and the appropriate COS against the CLS prompt.

ISDN BRIT implementation

LD 16 – Configure the QSIG Call Diversion Notification Remote Capability for a BRI route with QSIG Generic Functional Interface.

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	RDB	Route Data Block.
CUST	xx	Customer number, as defined in LD 15. xx = 0-99 for Options 51C-81C xx = 0-31 for Option 11C.
ROUT	0-511 0-127	Route number, for Option 51C-81C. For Option 11C.

TKTP	aaa	Trunk type.
DTRK	YES	Digital Trunk Route.
BRIP	NO	ISDN BRI packet handler route (NO is entered, since packet data is not required).
- DGTP	BRI	Digital trunk type.
ISDN	YES	Integrated Services Digital Network.
...		
- IFC		QSIG interface type where xxxx is:
	ESGF	Interface ID for ETSI QSIG with GF capability.
	ISGF	Interface ID for ISO with GF capability.
...		
RCAP		QSIG SS Call Diversion Notification remote capability. Configure sending of QSIG Diversion Notification Information, treatment of Rerouting request and coding of operations. If coded as Object Identifier, the remote capability ends with 'O", whereas for Integer Value, the remote capability ends with 'I'. Only one remote capability is allowed. Refer to Table 1 for further information.
	DV1I	Diversion information is sent to remote switch.
	DV1O	Diversion information is sent to remote switch.
	DV2I	Rerouting requests from remote switch are processed. Rerouting requests from remote switch are processed.
	DV2O	Diversion information is sent to remote switch. Rerouting requests from remote switch are processed.
	DV3I	Diversion information is sent to remote switch.
	DV3O	Rerouting requests from remote switch are processed.
		Precede with 'X' to remove capability, **but do not specify the coding type**. For example, XDV3 or XDV1 (and not XDV3I or XDV1O).

LD 27 – Configure the Terminal Service Profile (TSP), to implement the QSIG Call Diversion options on BRI sets.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	TSP	Terminal Service Profile.
DSL	 lll s cc dsl#	DSL Terminal Number location, for Options 51C-81C: lll (superloop) = 0-156 (must be zero or a number divisible by 4) s (shelf) = 0-1 cc (card) = 0-15 dsl# (DSL location) = 0-7
	 cc dsl	DSL Terminal Number location, for Option 11C: cc (card) = 1-20 dsl# (DSL number) = 0-7
USID	x	User Service Identifier.
...		
DN	xxx...x	Directory Number associated with TSP (1 to 7 digits).
...		
FEAT	xxxx	QSIG Call Diversion Notification for calling party where xxxx: DNO1 = no notification DNO2 = notification without forwarded-to (diverted) party's number and name (DNO3) = notification with forwarded-to (diverted) party's number and name when available.
FEAT	xxxx	QSIG Call Diversion Notification for diverted-to party where xxxx: DNDN = no notification of called party's number and name notification (DNDY) = notification with called party's number and name when available (default).
...		

Feature operation

No specific operating procedures are required to use this feature.

ISDN QSIG Call Transfer Notification

Contents

The following are the topics in this section:

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Regional material statement

ISDN BRI trunking is not available in North America. Contact your system supplier or your Nortel Networks representative to verify support of this product in your area.

Feature description

The QSIG Call Transfer Notification feature supports the Call Transfer Notification capability over QSIG private networks, and over mixed QSIG/MCDN and QSIG/DPNSS1 networks. This applies to 2.0 Mbps Primary Rate Interface (PRI2), and ISDN Basic Rate Trunking (BRIT) applications.

The QSIG Call Transfer supplementary service, provided the capability of using the Transfer by Call Join function to join two separate QSIG calls, resulting from a call transfer activation, into one call between the originating party and the transferred-to party. However, there was no notification, via protocol message exchange between the originating and transferring nodes, that the transfer had taken place.

With the introduction of the QSIG Call Transfer Notification feature, whenever a call transfer occurs over a QSIG link, or over a QSIG/MCDN or QSIG/DPNSS1 gateway, a notification of the transfer is sent to the originating and transferred-to party. The information, conveyed in call transfer messages, includes the redirection and originating number, redirection and originating name, and the redirection reason (transfer). This information is displayed on the sets of originating and terminating party. It is also captured in Call Detail Recording records.

The method of Operation Coding for the Call Transfer Notification feature is configured by Object Identifier, used for European Telecommunications Standard Institute (ETSI) interfaces, or by Integer Value, used for International Standards Organization (ISO) interfaces. The Operation Coding method is configured as a Remote Capability using the RCAP prompt in LD 16 and LD 17).

QSIG Call Transfer Notification at work

Consider the following application of the QSIG Call Transfer Notification feature being applied to a call within a QSIG Meridian 1 network (the network signaling occurs over QSIG links).

Station A (Betty, DN 5000) calls Station B (Anne, DN 4000), over a QSIG link. Station B transfers to Station C (Cindy, DN 6000), also over a QSIG link. Table 78 summarizes the display options pertaining to the originating set and transferred-to set.

Note: The underlined Class of Service values are in effect.

Table 78
Originating set and transferred-to set display possibilities (Part 1 of 2)

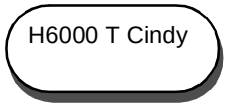
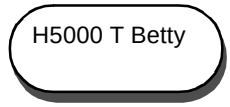
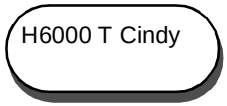
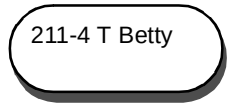
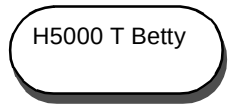
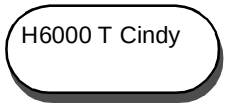
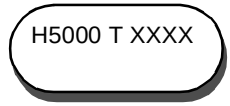
Originating set Class of Service	**Originating set display**	**Transferred-to set Class of Service**	**Transferred-to set display**
	Originating set display after receipt of transfer notification from transferred-to set		Transferred-to set display after receipt of transfer notification from originating set
CNDA NAMA DDGA		CNDA NAMA DDGA	
CNDA NAMA DDGD		CNDA NAMA DDGA	
CNDD NAMA DDGA		CNDA NAMA DDGA	
CNDA NAMD DDGA		CNDA NAMA DDGA	

Table 78
Originating set and transferred-to set display possibilities (Part 2 of 2)

CNDA NAMA DDGA	_ _ _ _ _ T Cindy	CNDA NAMA DDGD	H5000 T Betty
CNDA NAMA DDGA	H6000 T Cindy	CNDD NAMA DDGA	H5000
CNDA NAMA DDGA	H6000 T XXXX	CNDA NAMD DDGA	H5000 T Betty

Note 1: No reason is displayed if the Class Of Service CNDD is configured on the set

Note 2: When presentation of the remote party number is not allowed (CLS DDGD on the remote party), the other party displays the following instead of the DN:

- The trunk access code and the route member, if a trunk is involved, that is, transfer to an other node; or
- Several dashes, if this party is on the transferring node, that is, local transfer to a node.

Operating parameters

The Call Transfer by rerouting method is not implemented.

The subAdressTransfer invoke APDU is not generated by Meridian1:

The maximum allowed size of the name information is 50 characters for QSIG. However, a maximum of 27 characters is allowed with the Calling Party Name Display (CPND) feature. Therefore, name display information might be truncated.

The call transfer notification is sent whatever the numbering plan is. However, the redirection number that is sent has any meaning only if either the Coordinated Dialing Plan (CDP) or Uniform Dialing Plan (UDP) is used to build the redirection number.

Digit manipulation can not be applied to the redirection number sent in the Call Transfer messages.

The Call Transfer Notification for a call extended by an attendant in an MCDN network is provided by the NAS feature. The Call Transfer QSIG/MCDN gateway does not map this NAS information into QSIG messages.

Feature interactions

Calling Line Identification Presentation/Restriction

CLIP/CLIR applies to the originating and to the transferred-to set display.

Connected Line Identification Presentation/Restriction

COLP/COLR applies to the originating and to the transferred-to set display.

Calling Name Identification Presentation/Restriction (CNIP/CNIR)

The Calling, Alerting or Connected name are not included in the ctComplete invoke APDU, at the transferring PINX.

Connected Name Identification Presentation/Restriction (CONP/CONR)

If a name, either from QSIG Name Display Service or QSIG Call Transfer Notification, is received, it will be displayed, if no presentation option forbids it.

On-Hold

The interaction with On-Hold is handled with the same manner as between MCDN Call Transfer Display and On-Hold.

Symposium Call Center Server

If a QSIG call is transferred to a Symposium Call Center DN, the call type is updated in the ICC message for QSIG Transfer.

Meridian Mail

A QSIG call transferred to Meridian Mail may access the different Meridian Mail functionalities (message reception, mailbox interrogation).

QSIG Name Display Supplementary Services (QNDS)

Calling, Alerting & Connected Name

The Calling, Alerting or Connected name is not included in the ctComplete invoke APDU, at the transferring PINX.

Connected Name

If a name, either from QSIG Name Display Service and QSIG Call Transfer Notification, is received, it will be displayed only if no presentation option forbids it.

QSIG Diversion

Call Forwarding Unconditional/Call Forwarding Busy

When the call transfer is completed, the diverted-to set displays the Call Transfer primary user DN and the transfer notification reason.

Call Forwarding No Reply

Call Transfer interacts with Call Forward No Reply (CFNR), if CFNR is invoked for an unanswered, transferred call.

Either the Transferring PINX acts as Rerouting PINX (in case of call transfer by join and call forwarding by rerouting, or the Secondary PINX acts as Rerouting PINX (call forwarding by forward switching.

QSIG Path Replacement (QPR)

QSIG Call Transfer as trigger for QPR

QSIG Call Transfer can be configured as a trigger for QSIG Path Replacement. If configured, after the completion of the transfer, QSIG Path Replacement starts to obtain a more efficient connection, if necessary.

Feature packaging

The following packages are required for the QSIG Call Transfer Notification feature:

- Integrated Services Digital Network (ISDN) package 145
- Primary Rate Access (PRI) package 146
- 2.0 Mb Primary Rate Access (PRI2) package 154
- International Primary Rate Access (IPRA) package 202
- Multi-purpose Serial Data Link (MSDL) package 222
- Q-reference Signaling Point Interface Supplementary Services (QSIG-SS) package 263
- QSIG Generic Functional Protocol Transport (QSIG-GF) package 305
- QSIG Supplementary Services (QSIG-SS) package 316

For ISDN Basic Rate Interface Trunking (BRIT), the following additional packages are required:

- ISDN Basic rate Access (BRI) 216
- ISDN Basic Rate Trunk Access (BRIT) package 233

For a QSIG/DPNSS1 Gateway, the following additional packages are required:

- Integrated Digital Access (IDA) package 122
- Digital Private Networking Signaling System No. 1 (DPNSS) 123
- DPNSS Network Services (DNWK) package 231

For notification display, the following additional packages are required:

- Digit Display (DDSP) 19
- Call Party Name Display (CPND) package 95

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 15 – Configure a Private Integrated Services Network Exchange (PINX) DN for a customer.

2 LD 17 – Configure the method of Operation Coding for the QSIG Call Transfer Notification feature, for the associated QSIG D-Channel. The value is configured as a remote capability. It may be either by Object Identifier, used for ETSI, or by Integer Value, used for ISO.

3 LD 95 – Configure the Reason for Redirection, and the Call Transfer mnemonic, for a customer.

4 LD 95 – Define a name string for a customer.

5 LD 10 – Configure an analog (500/2500) transferring set.

6 LD 11 – Configure a Meridian 1 proprietary transferring set. Use LD 11, so that after Call Transfer, the originating set display and the transferred-to set display show the name and number associated with the transferred-to set and originating set, respectively.

7 LD 11 – Configure a Meridian 1 proprietary set.

8 LD 16 - Configure the method of Operation Coding for the QSIG Call Transfer Notification, for the associated QSIG ISDN BRI trunk route.

This section contains the procedures required to configure the QSIG Supplementary Services - Name Display Enhancement feature on a Meridian 1 PBX.

For ISDN PRI:

- Configure a Private Integrated Services Network Exchange (PINX) DN for a customer, using LD 15.
- Configure the method of Operation Coding for the QSIG Call Transfer Notification for the associated D-Channel, using LD 17.
- Configure the Reason for Redirection, and the Call Transfer mnemonic, for a customer, using LD 95.
- Define a name string for a customer, using LD 95.

- Configure an analog (500/2500) transferring set, using LD 10, so that after Call Transfer, the originating set display and the transferred-to set display show the name and number associated with the transferred-to set and originating set, respectively.
- Configure a Meridian 1 proprietary transferring set, using LD 11, so that after Call Transfer, the originating set display and the transferred-to set display show the name and number associated with the transferred-to set and originating set, respectively.
- Configure a Meridian 1 proprietary set, using LD 11, so that if it originates or receives a transferred call over a QSIG link, it displays the redirected/connected name and number, after it is received.

For ISDN BRIT:

- Configure the method of Operation Coding for the QSIG Call Transfer Notification, for the associated QSIG ISDN BRI trunk route, using LD 16.

ISDN PRI implementation

LD 15 – Configure a Private Integrated Services Network Exchange (PINX) DN for a customer.

Prompt	Response	Description
REQ:	CHG	Change existing data.
TYPE:	NET	Networking data.
...		
CUST	xx	Customer number, as denied in LD 15. xx = 0-99 for Options 51C-81C. xx = 0-31 for Option 11C.
...		
- PINX_DN	xx...x	Private Integrated Services Network Exchange DN (1-7 digits).
...		

LD 17 – Configure the method of Operation Coding for the QSIG Call Transfer Notification feature, for the associated QSIG D-Channel. The value is configured as a remote capability. It may be either by Object Identifier, used for ETSI, or by Integer Value, used for ISO.

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	ADAN	Action Device and Number.
- ADAN	NEW DCH xx	Add a D-Channel on port 0-63, for Options 51C-81C.
	NEW DCH xx	Add a D-Channel on port 0-14, for Option 11C.
...		
- IFC	ESGF ISGF	ETSI QSIG interface with GF platform. ISO QSIG interface with GF platform.
...		
- RCAP		Enter the Operation Coding method for the QSIG Call Transfer Notification feature.
	CTI XCTI CTO XCTO	Call Transfer Operation Coding method is by Integer Value. Remove the Call Transfer Coding by Integer Value. Call Transfer Operation Coding method is by Object ID. Remove the Call Transfer Coding by Object ID.
		Note: CTO and CTI are mutually exclusive.
...		

LD 95 – Configure the Reason for Redirection, and the Call Transfer mnemonic, for a customer.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	CPND	Configure the Calling Party Name Display data block.
CUST	xx	Customer number, as defined in LD 15. xx = 0-99 for Options 51C-81C. xx = 0-31 for Option 11C.

...		
RESN	(NO) YES	(Do not) display the reason for redirection. Enter YES.
- XFER	(T) aaaa	1-4 character mnemonic for Call Transfer. The default is T.

LD 95 – Define a name string for a customer.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	NAME	Create a new Calling Party Name string.
CUST	xx	Customer number, as previously entered in LD 95 when configuring the CPND data block. xx = 0-99 for Options 51C-81C. xx = 0-31 for Option 11C.
...		
DN	xxx...x	Directory Number (1 to 7 digits) to which the name string is associated.
- NAME	a...a	CPND name, in ASCII characters.

LD 10 – Configure an analog (500/2500) transferring set.

Use LD 10, so that after Call Transfer, the originating set display and the transferred-to set display, show the name and number associated with the transferred-to set and originating set, respectively.

Prompt	Response	Description
REQ:	NEW CHG	Add new data. Change existing data.
TYPE:	aaa	Type of analog set. aaa = 500 or 2500.
TN	 l s c u	Terminal Number, for Options 51C-81C. l = loop, s = shelf, c = card, u = unit.

	c u	Terminal Number for Option 11C. c = card, u = unit.
...		
CUST	xx	Customer number associated with this set, as previously entered in LD 15. xx = 0-99 for Options 51C-81C. xx = 0-31 for Option 11C.
...		
DN	xxxx yyy	Directory Number and CLID entry (range for yyy is 0 - value entered in the SIZE prompt in LD 15).
- CPND	NEW CHG OUT	Add new Calling Party Name Display data. Change existing Calling Party Name Display data. Remove Calling Party Name Display data.
- - CPND_LAN	aaa	Calling Party Name Display language.
- - NAME	aaaa bbbb	Calling Party Name Display name. aaaa = first name, bbbb = last name.
...		
CLS		Class of Service.
	(XFD) XFA	Transfer (denied) allowed on this set.
	(CNDD) CNDA	Name Display (denied) allowed on this set.
	(NAMD) NAMA	Name Display (denied) allowed on other sets.
	(DDGD) DDGA	DN display (denied) allowed on other sets.
CLS	<CR>	The CLS prompt is generated until <cr> is entered.
...		

LD 11 – Configure a Meridian 1 proprietary transferring set. Use LD 11, so that after Call Transfer, the originating set display and the transferred-to set display show the name and number associated with the transferred-to set and originating set, respectively.

Prompt	Response	Description
REQ:	NEW CHG	Add new data. Change existing data.
TYPE:	aaa	Type of Meridian 1 proprietary set.
TN	 l s c u c u	Terminal Number, for Options 51C-81C. l = loop, s = shelf, c = card, u = unit. Terminal Number for Option 11C. c = card, u = unit.
...		
CUST	xx	Customer number associated with this set, as defined in LD 15. xx = 0-99 for Options 51C-81C. xx = 0-31 for Option 11C.
...		
DN	xxxx yyy	Directory Number and CLID entry (range for yyy is 0 - value entered in the SIZE prompt in LD 15).
- CPND	NEW CHG OUT	Add new Calling Party Name Display data. Change existing Calling Party Name Display data. Remove Calling Party Name Display data.
- - CPND_LAN	aaa	Calling Party Name Display language.
- - NAME	 aaaa bbbb	Calling Party Name Display name. First name. Last name.
...		
KEY	xx TRAN	Assign the Transfer key.
...		

CLS		Class of Service.
	(CNDD) CNDA	Name Display (denied) allowed on this set.
	(NAMD) NAMA	Name Display (denied) allowed on other sets.
	(DDGD) DDGA	DN display (denied) allowed on other sets.
CLS	<CR>	The CLS prompt is generated until <cr> is entered.
...		

LD 11 – Configure a Meridian 1 proprietary set.

Use LD 11, so that if it originates or receives a transferred call over a QSIG link, it displays the redirected/connected name and number, after it is received.

Prompt	**Response**	**Description**
REQ:	NEW CHG	Add new data. Change existing data.
TYPE:	aaa	Type of Meridian 1 proprietary set.
TN	 l s c u	Terminal Number, for Options 51C-81C. l = loop, s = shelf, c = card, u = unit.
	 c u	Terminal Number for Option 11C. c = card, u = unit.
...		
CUST	xx	Customer number associated with this set, as defined in LD 15. xx = 0-99 for Options 51C-81C. xx = 0-31 for Option 11C.
...		
DN	xxxx yyy	Directory Number and CLID entry (range for yyy is 0 - value entered in the SIZE prompt in LD 15).

- CPND	NEW CHG OUT	Add new Calling Party Name Display data. Change existing Calling Party Name Display data. Remove Calling Party Name Display data.
- - CPND_LAN	aaa	Calling Party Name Display language.
- - NAME	aaaa bbbb	Calling Party Name Display name. aaaa = first name. bbbb = last name.
...		
CLS		Class of Service.
	(CNDD) CNDA	Name Display (denied) allowed on this set.
	(NAMD) NAMA	Name Display (denied) allowed on other sets.
	(DDGD) DDGA	DN display (denied) allowed on other sets.
CLS	<CR>	The CLS prompt is generated until <cr> is entered.
...		

ISDN BRIT implementation

LD 16 - Configure the method of Operation Coding for the QSIG Call Transfer Notification, for the associated QSIG ISDN BRI trunk route.

Prompt	Response	Description
REQ	NEW	Add new data (ISDN BRI protocol group settings).
TYPE	RDB	Route Data Block.
CUST	xx	Customer number, as defined in Ld 15. xx = 0-99 for Options 51C-81C xx = 0-31 for Option 11C.
ROUT	0-511	Route number.
TKTP	aaa	Trunk type.

DTRK	YES	Digital Trunk Route.
BRIP	NO	ISDN BRI packet handler route (NO is entered, since packet data is not required).
- DGTP	BRI	Digital trunk type.
ISDN	YES	Integrated Services Digital Network.
...		
- IFC	ESGF ISGF	ETSI QSIG interface with GF platform. ISO QSIG interface with GF platform.
...		
- RCAP		Enter the Operation Coding method for the QSIG Call Transfer Notification feature.
	CTI XCTI CTO XCTO	Call Transfer Operation Coding method is by Integer Value. Remove the Call Transfer Coding by Integer Value. Call Transfer Operation Coding method is by Object ID. Remove the Call Transfer Coding by Object ID.
		Note: CTO and CTI are mutually exclusive.

Feature operation

No specific operating procedures are required to use this feature.

ISDN QSIG Channel ID Coding

Contents

The following are the topics in this section:

Feature description 1015
CHID IE mapping options 1016
Operating parameters 1017
Feature interactions 1018
Feature packaging 1018
Feature implementation 1018
Task summary list 1018
Feature operation 1019

Feature description

PBXs use different kinds of timeslot mapping in ISDN QSIG networks using PRI2 links. When the Meridian 1 interworks with these switches, the QSIG Channel ID Coding feature allows one of two mapping options to be configured.

The QSIG Channel ID Coding feature provides an option for two different mapping schemes for timeslots 17-31 on a PRI2 loop. The mapping scheme for timeslots 1-15 is not affected.

The mapping scheme is applicable for both encoding and decoding of the Channel ID IE.

Prior to the introduction of QSIG Channel ID Coding, the channel number in the Channel ID Information Element (IE) on a Meridian 1 PRI2 QSIG link matched the timeslot number. A summary of the previous mapping is shown in Table 79.

Table 79
Previous implementation of Channel IE and timeslot number

Timeslot number	Channel number for Meridian 1 software	Channel number in Channel ID IE.
1-15	1-15	1-15
17-31	16-30	17-31
16 (signaling)	31 (D-channel)	not applicable

CHID IE mapping options

With the QSIG Channel ID Coding feature, the D-channel can be configured with one of two CHID IE mapping options.

Timeslot number coded in CHID IE

With this option, the channel number of the CHID IE matches the timeslot number. Timeslots 17-31 are assigned channel numbers 17-31. This is the same as the method used prior to the introduction of the QSIG Channel ID Coding feature. A summary of the mapping performed is shown in Table 80.

Table 80
Timeslot number is coded in CHID IE

Timeslot number	Channel number for Meridian 1 software	Channel number in Channel ID IE.
1-15	1-15	1-15
17-31	16-30	17-31
16 (signaling)	31 (D-channel)	not applicable

Channel number coded in CHID IE

With this option, the channel number of the CHID IE matches the Meridian 1 software channel number. Timeslots 17-31 are assigned channel numbers 16-30. A summary of the mapping performed is shown in Table 81.

Table 81
Channel number in Meridian 1 software is coded in CHID IE

Timeslot number	Channel number in Meridian 1 software	Channel number in Channel ID IE.
1-15	1-15	1-15
17-31	16-30	16-30
16 (signaling)	31 (D-channel)	not applicable

The option for the QSIG Channel ID Coding feature is configured in Overlay 17. The two choices are:

- QCHID = NO – Timeslot values 17-31 of the PRI2 loop are associated with channel number 16-30 of the Channel ID IE.
- QCHID = YES – Timeslot values 17-31 of the PRI2 loop are associated with channel number 17-31 of the Channel ID IE (same as previous operation).

Operating parameters

QSIG Channel ID Coding is supported on all 2.0 Mbps QSIG interfaces.

There are two choices of hardware for Option 51C, Option 61C, and Option 81C systems:

- PRI2 card (NT8D72) and MSDL card (NT6D80)
- Dual port DTI/PRI2 card (NTCK43) and either the Downloadable D-channel Daughterboard card (NTBK51) or the MSDL card (NT6D80)

These systems require the QPC775 (Release E) or the QPC471 Clock Controller card.

The hardware required for the Option 11C is:

- PRI2 card (NTBK50)
- Downloadable D-channel Daughterboard card (NTBK51)
- Clock Controller (NTAK20)

When a Meridian 1 connects to another Meridian 1 system, the proper setting for QCHID (NO or YES) depends on the software equipped at both switches. The QCHID can be YES or NO, provided it has the same value on both switches.

Feature interactions

There are no feature interactions specified for this feature.

Feature packaging

The following packages are required for the QSIG Channel ID Coding feature:

- ISDN Signaling (ISDN) package 145
- 2 Mb PRI (PRI2) package 154
- International PRA (IPRA) package 202
- Multi-Purpose Serial Data Link (MSDL) package 222
- QSIG Interface (QSIG) package 263
- QSIG GF Transport (QSIGGF) package 305

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 17 – Configure the QCHID parameter for the QSIG PRI2 interface.

LD 17 – Configure the QCHID parameter for the QSIG PRI2 interface.

Prompt	Response	Description
REQ	CHG	Change.

TYPE	ADAN	Action Device and Number.
- ADAN	CHG DCH 0-63	Change D-channel.
...	...	
- IFC		Interface type for D-channel.
	ISIG	Interface ID for ISO QSIG
	ESIG	Interface ID for ETSI QSIG
	ESGF	ETSI QSIG interface with GF capability.
	ISGF	ISO QSIG interface with GF capability.
	EGF4	ETSI QSIG version 4 with GF capability.
...	...	
- DCHL	xxx	PRI2 loop number for D-channel.
...	...	
- RLS	xx	Release ID of the switch at the far end of the D-channel.
- QCHID	NO	Timeslot values 17-31 of the PRI2 loop are associated with channel number 16-30 of the Channel ID IE.
	(YES)	Timeslot values 17-31 of the PRI2 loop are associated with channel number 17-31 of the Channel ID IE (same as previous operation). This prompt does not appear for PRI (1.5 Mb) links.
...	...	

Feature operation

There are no operating procedures specified for this feature.

ISDN QSIG/ETSI GF Enhancement

Contents

The following are the topics in this section:

Regional material statement 1021
Feature description 1021
Operating parameters 1023
Feature interactions 1026
Feature packaging 1027
Feature implementation 1027
Feature operation 1027

Regional material statement

ISDN BRI trunking is not available in North America. Contact your system supplier or your Nortel Networks representative to verify support of this product in your area.

Feature description

The Integrated Services Digital Network ISDN (ISDN) Q-reference Signaling Point (QSIG)/European Telecommunications Standards Institute (ETSI) Generic Functional Transport (GFT) was introduced, to provide a set of generic transport mechanisms to support QSIG supplementary services over a Private or Public Integrated Services Network.

It must be noted that the ISDN QSIG/ETSI GF platform by itself does not actually support any features, it only provides the platform to be used by the various QSIG supplementary services.

The ISDN QSIG/ETSI Generic Functional (GF) Transport Enhancement feature has been introduced to provide improvements in call control, to allow the supported QSIG signaling protocols to better work seamlessly together. These improvements comprise the following:

For QSIG GFT:

- Support of Call-Independent gateways between QSIG, and EuroISDN, Meridian Customer Defined Networking MCDN, and Digital Private Networking Signaling No. 1 (DPNSS1).

  The QSIG Cal-Independent Generic Functional Transport - Control capability has been modified, so that at these gateways, the CONNECT message of a QSIG supplementary service is not systematically sent after the receipt of a QSIG SETUP message. Instead, the control of the call processing, such as controlling the expiration of the T303 and T310 timers, is left to the QSIG supplementary service operating over the QSIG GFT.

- Call Related Application Protocol Data Unit (APDU) transport.

  Transit Private Integrated Services Network Exchange (PINX) operation:

  The Call Related APDU transport has been modified, to ensure that a call that is being optimized during QSIG Path Replacement is using the optimum path (the first available alternate route in a route list index). A transit Private Integrated Services Network Exchange (PINX) may now determine whether or not to intercept a Facility Information Element (IE) containing a Network Facility Extension (NFE) EndPinx message.

  This modification also allows a Facility IE carried in a Setup message, that has encountered congestion, to be included in an alternate call, if QSIG Alternate Routing is activated on a transit node.

  Calculating the remaining available length for an APDU:

  The method of calculating the available length for an APDU in basic QSIG call control messages has been made more accurate. The available length for an APDU is now calculated as the difference between the maximum message length (260 octets) and the exact length of other mandatory and non-mandatory IEs in the message.

For ETSI GFT:

- Call Related Application Protocol Data Unit (APDU) transport.

  Calculating the remaining available length for an APDU:

  The method of calculating the available length for an APDU in basic ETSI call control messages has been made more accurate. The available length for an APDU is now calculated as the difference between the maximum message length (260 octets) and the exact length of other mandatory and non-mandatory IEs in the message.

Operating parameters

The operating parameters that follow are carried over from the ETSI Generic Functional Transport feature.

The following operating parameters apply to the ISDN QSIG ETSI GF component of the feature enhancements:

- The ETSI GF gateways to and from other signaling systems, such as QSIG, Digital Private Networking Signaling No. 1 (DPNSS1), and Meridian Customer Defined Networking (MCDN), are only supported for Call Independent gateways.

- The following ETSI GF functionalities are not supported:
  - the control of supplementary services using the separate message approach (Hold/Retrieve messages)
  - the bearer-related broadcast transport mechanism (multipoint configuration)
  - the bearer-independent point-to-point connections transport mechanism
  - the bearer-independent broadcast transport mechanism
  - the generic notification procedures
  - the network-side channel reservation function
  - the generic procedures for supplementary services management
  - the generic status request procedure
  - the support of the Extended Facility Information Element (FIE)

- During call processing, the translation of a DN address requires that the DN be associated with a customer number. For the processing of an ETSI basic call, this customer number association is found through the B-Channel identified in the Channel Identification Information Element.

  For the DN address translation that is not associated with a basic call, the customer number/DN association has to be determined using other methods. For an ISDN BRI trunk Digital Subscriber Loop (DSL) interface, the customer number is associated with a D-Channel. For an ISDN PRI interface, the Private Integrated Services Network Exchange Customer (PINX_CUST) prompt in LD 17 is used to define a customer number to a D-Channel. This implies that bearer-independent messages on an ISDN PRI D-Channel are associated with a single customer, as configured in LD 17.

  For example, in a multi-customer configuration, if every customer on a Meridian 1 PBX wishes to use the bearer-independent transport service over an ETSI PRI interface, then each customer requires the use of a separate D-Channel.

- The ISDN ETSI GF platform supports up to eight Remote Operation Service Element (ROSE) components in one message, either in a single Facility Information Element (FIE) or multiple FIEs. If a supplementary service requests that the ISDN ETSI GF Transport send a message exceeding this limit, a notification message is sent to the supplementary service.

The following operating parameters apply to the ISDN QSIG ETSI GF component of the feature enhancements:

- The QSIG GF gateways to and from other signaling systems, beyond the Q reference point, such, Digital Private Networking Signaling No. 1 (DPNSS1), EuroISDN, and Meridian Customer Defined Networking (MCDN), are only supported for Call Independent gateways.

- At a QSIG to EuroISDN, DPNSS1, or MCDN gateway, when a call-independent Setup message is received which has a valid gateway destination, and which includes several FIEs that belong to different supplementary services, then the gateway is not supported by this feature.

- The MCDN to QSIG GF “protocol converter” does not actually convert the MCDN features, it only provides the conversion platform. The individual MCDN features have to be ported to the ISDN QSIG GF separately.
- This feature does not implement or enhance any ISDN QSIG supplementary services, or networking applications such as Virtual Network Services (VNS).
- Although the transport of Manufacturer Specific Information (MSI) across a ISDN QSIG interface is used by the MCDN to QSIG GF “protocol converter”, a tandem PINX receiving this information may discard it. The MSI may be passed on to the next node only if the transit PINX is a Meridian 1.
- During call processing, the translation of a DN address requires that the DN be associated with a customer number. For the processing of a QSIG basic call, this customer number association is found through the B-Channel identified in the Channel Identification Information Element. For the DN address translation that is not associated with a basic call, the customer number/DN association has to be determined using other methods.

  For an ISDN BRI trunk Digital Subscriber Loop (DSL) interface, the customer number is associated with a D-Channel.

  The ISDN QSIG GF transport does not support the use of the MCDN proprietary Private Network Identifier (PNI) numbers for the customer association. For an ISDN PRI interface, the Private Integrated Services Network Exchange Customer (PINX_CUST) prompt in LD 17 is used to define a customer number to a D-Channel. This implies that all call independent messages on an ISDN PRI D-Channel are associated with a single customer, as configured in LD 17.

  For example, in a multi-customer configuration, if every customer on a Meridian 1 PBX wishes to use the call-independent transport service over a QSIG PRI interface, then each customer requires the use of a separate D-Channel. Note that this limitation also applies to MCDN features that are converted by the MCDN to QSIG GF “protocol converter”, to function over a QSIG network.

- Basic call setup and call-independent connection setup originating from a QSIG supplementary service may be rejected by the far end, due to the unavailability of system resources, and due to overdo control. A notification message will be sent to the supplementary service, so that it may initiate a retry.
- The call-independent connection-oriented APDU transport service requires that a transit node PINX retain any information pertaining to a call-independent connection, for the duration of the connection. This information may be required by a particular application to properly route subsequent messages associated with the same call-independent connection.
- This requirement at the transit PINX implies that system resources, such as call registers, are used by the call-independent transport services at the tandem nodes. Therefore, applications that make use of call-independent transport services may be limited by the amount of available system resources allocated at the transit PINX.
- The Call Independent APDU transport can be supported by two different transport mechanisms, connection-oriented, or without connection. The later method is not supported on the ISDN QSIG GF platform.
- The Association Control Service Element (ACSE) and Dialogue Service Element (DSE) for application association is not supported by the ISDN QSIG GF platform on a Meridian 1. ACSE and DSE protocol data units that are received by the ISDN GF platform facility at a destination Private Integrated Services Network Exchange (PINX) will be discarded. A transit INX will pass on the ACSE and DSE data units transparently to the next node.
- The ISDN QSIG GF platform supports up to eight Application Protocol Data Units (APDUs), that is, Remote Operation Service Element (ROSE) components, in one message, either in a single Facility Information Element (FIE) or multiple FIEs. If a supplementary service requests that the ISDN QSIG GF Transport send a message exceeding this limit, a notification message is sent to the supplementary service.

Feature interactions

There are no feature interactions for this feature.

Feature packaging

The following packages are required for the ISDN QSIG/ETSI GF Enhancement feature:

- Integrated Services Digital Network (ISDN) package 145
- Primary Rate Access (PRA) package 146 for 1.5 Mb signaling,
- International Primary Rate Access (IPRA) package 202
- 2.0 Mb Primary Rate Access (PRI2) package 154 for 2.0 Mb signaling
- Multi-purpose Serial Data Link (MSDL) package 222
- Q-reference Signaling Point Interface (QSIG) package 263
- QSIG Generic Functional Protocol Transport (QSIG-GF) package 305

For ISDN Signaling Link (ISL) QSIG, the following additional packages are required:

- ISDN Signaling Link (ISL) package 147

For ISDN Basic Rate Interface Trunking (BRIT), the following additional packages are required:

- ISDN Basic rate Access (BRI) 216
- ISDN Basic Rate Trunk Access (BRIT) package 233

Feature implementation

There is no implementation required for this feature.

Feature operation

No operating procedures are required to use this feature.

ISDN QSIG/EuroISDN Call Completion

Contents

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Regional material statement

The information presented in this section does not pertain to all market regions. Contact your system supplier or your Nortel Networks representative to verify support of this product in your area.

Feature description

The ISDN QSIG/EuroISDN Call Completion feature expands Ring Again functionalities on QSIG and EuroISDN interfaces. This feature provides Call Completion to Busy Subscriber (CCBS) and Call Completion on No Response (CCNR) supplementary services.

The Call Completion to Busy Subscriber (CCBS) supplementary service allows the calling party to apply a Ring Again request when encountering a busy Directory Number (DN). The Meridian 1 alerts the calling party when occupied DN is available to receive a call. The calling party has the option of completing this call without making a new call attempt. CCBS is supported on QSIG and EuroISDN signalling protocols.

Call Completion on No Response (CCNR) supplementary service allows the calling party to apply a Ring Again request to an unanswered DN. With this service, the Meridian 1 alerts the calling party when the dialed DN becomes idle after a period of activity. The calling party has the option of completing the call without making a new call attempt. CCNR is only supported on QSIG signalling protocols.

Operating parameters

ISDN QSIG/EuroISDN Call Completion supports Uniform Dialing, Customer Dialing and Group Dialing plans.

Since the Ring Again feature is configured on set level basis, either by Class of Service or Ring Again key, a set cannot be programmed with CCBS on EuroISDN denied and Meridian Customer Defined Network (MCDN) Network Ring Again allowed. Ring Again is allowed or denied locally or network wide in the same manner.

ISDN QSIG/EuroISDN is supported in ETSI compliant countries.

This feature uses QSIG GF and ETSI GF platforms. With the development of the QSIG Generic Transport (GF) feature, the Call Completion on No Response (CCNR) and Call Completion to Busy Subscriber service on QSIG cannot be involved in any gateway.

Call Completion to Busy Subscriber and Call Completion on No Response are not supported on ISDN BRI sets.

Gateways between EuroISDN CCBS, MCDN Network Ring Again on Busy and DPNSS1 Call Back When Free are supported.

A PINX (Private Integrated Services Network Exchange) DN must be configured in the Customer Data Block (LD 15). The PINX DN is used for routing free notification on the MCDN or DPNSS1 if the EuroISDN network does not provide a calling number for the service. The DN configured should be consistent with the type of number plan used. PINX DN is also used for incoming Direct Inward Dialing (DID) calls in the same manner as Listed Directory Number 0 (LDN0) is used for a basic call.

Existing limitations, applicable to standalone or network wide Ring Again operation, apply to CCNR and CCBS on QSIG and CCBS on QSIG and EuroISDN.

Feature interactions

Access Restrictions
Call Restriction
Trunk Group Access Restrictions

ISDN QSIG/EuroISDN Call Completion does not override Access, Call Restriction or Trunk Group Access restrictions. When Call Completion is activated, the second call has the same restrictions as the initial call that received either no answer or a busy indication.

Advice of Charge for EuroISDN

Advice of Charge applies to the initial and call completion (second call). The initial call receives the same charging information as a normal busy call. The call completion receives the same charging information as the first call.

Attendant Consoles

Call Completion requests cannot be directed to or from an Attendant Console.

Automatic Call Distribution

Call Completion requests cannot be directed to or from Automatic Call Distribution (ACD) Directory Numbers (DNs).

An ACD set that uses a normal DN key (not the ACD key) can activate the Ring Again key when encountering a busy or no answer situation.

Call Detail Recording

A Call Detail Recording (CDR) is not produced for Call Completion signaling. The second call receives a CDR as a normal call.

Call Forward All Calls

When the Call Forward feature is activated on a local basis and an incoming Call Completion request is received, the Call Completion request is registered against the forwarded DN.

Call Transfer

Call Completion notification is only presented to the Call Completion originating set. This notification cannot be transferred to another station. Once the second call is completed, the call can be transferred.

If a user encounters a busy or no answer situation during a transfer operation, Call Completion can be activated.

Call Waiting

On an Analog (500/2500 type) set, Call Completion notification waits until the set has finished an active call. If Call Waiting is configured on a set, notification is presented after the Call Waiting call. If an additional call is queued while Ring Again free notification is waiting on a set, the waiting call takes precedence over the Call Completion notification. An established Call Completion call is also queued if a set has Call Waiting feature equipped and is occupied on another call.

Conference

A Call Completion request cannot be made on a conference call attempt.

Direct Inward System Access

Call Completion on Busy Subscriber (CCBS) and Call Completion No Response (CCNR) are not supported on Direct Inward System Access (DISA) calls when the call destination is busy.

Do Not Disturb

An incoming notification overrides a set with Do Not Disturb (DND) activated. Call Completion requests can be applied to sets with the DND feature activated. However, this request does not advance until the DND feature is deactivated.

EuroISDN Trunk - Network Side

Call Completion to Busy Subscriber is supported on a EuroISDN Trunk - Network Side connectivity interface.

Call Completion on No Reply is supported on QSIG and DPNSS1 (as Call Back When Next Used) interfaces, corresponding to the MCDN Network Ring Again on No Answer feature. It is not supported on a EuroISDN Trunk - Network Side connectivity interface.

Flexible Feature Codes

Analog (500/2500 type) set can use Flexible Feature Codes (FFCs) to activate Call Completion to Busy Subscriber requests.

Group Call

Call Completion cannot be applied to a Group Call.

Group Hunt

Call Completion to Busy Subscriber cannot be applied to Pilot DN when no idle set is located during a Group Hunt call.

Hot Line

Call Completion cannot be used in conjunction with the Hot Line feature.

Maintenance Busy

Call Completion on Busy Subscriber is not accepted against a set in Maintenance Busy state.

Make Set Busy

Sets that have Make Set Busy (MSB) activated can request Call Completion to another DN, as the free notification overrides the MSB feature. Incoming Call Completion to Busy Subscriber (CCBS) requests do not override the MSB feature. A set is considered busy while MSB is active. A CCBS request is registered against a busy set, but only advances when the MSB feature is deactivated and the set remains free.

Permanent Hold

Analog (500/2500 type) sets with Permanent Hold cannot use the Ring Again functionalities.

Ring Again
Ring Again No Answer

Analog (500/2500 type) sets can have only one Call Completion to Busy Subscriber request at a given time. Meridian 1 proprietary sets can make Ring Again requests based on the number of Ring Again keys programmed on a set.

Feature packaging

ISDN QSIG/EuroISDN Call Completion (QSIG-SS) is package 316. The package dependencies for QSIG-SS are:

- Optional Features (OPTF) package 1; and
- ISDN QSIG GF Transport (QSIGGF) package 305.

Depending on the application, the following packages are also required.

For the QSIG ISDN PRI interface:

- Digit Display (DDSP) package 19;
- Coordinated Dialing Plan (CDP) package 59;
- Integrated Services Digital Network (ISDN) package 145;
- Primary Rate Interface (PRI) package 146; or
- 2.0 Mb Primary Rate Access (PRI2) package 154;
- Flexible Numbering Plan (FNP) package 160;
- Overlap Signaling (OVLP) package 184 (optional);
- International Primary Rate Access (IPRA) package 202;
- Multipurpose Serial Data Link (MSDL) package 222; and
- QSIG Interface (QSIG) package 263.

For the QSIG ISDN BRI interface:

- Digit Display (DDSP) package 19;
- Integrated Services Digital Network (ISDN) package 145;
- Overlap Signaling (OVLP) package 184 (optional);
- Basic Rate Interface (BRI) package 216;

- ISDN BRI Trunk Application (BRIT) package 233; and
- QSIG Interface (QSIG) package 263.

The EuroISDN Call Completion Supplementary Service (ETSI-SS) is package 323.

For the EuroISDN ISDN PRI interface:

- Digit Display (DDSP) package 19;
- Coordinated Dialing Plan (CDP) package 59;
- Integrated Services Digital Network (ISDN) package 145;
- 2.0 Mb Primary Rate Access (PRI2) package 154;
- Flexible Numbering Plan (FNP) package 160;
- ISDN Supplementary Features (ISDN INTL SUPP) package 161;
- Overlap Signaling (OVLP) package 184 (optional);
- International Primary Rate Access (IPRA) package 202;
- Multipurpose Serial Data Link (MSDL) package 222; and
- EuroISDN (EURO) package 261.

For the EuroISDN ISDN BRI interface:

- Digit Display (DDSP) package 19;
- Integrated Services Digital Network (ISDN) package 145;
- ISDN Supplementary Features (ISDN INTL SUPP) package 161;
- Overlap Signaling (OVLP) package 184 (optional);
- Basic Rate Interface (BRI) package 216;
- ISDN BRI Trunk Application (BRIT) package 233; and
- EuroISDN (EURO) package 261.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 17 – Configure Remote Capabilities to Call Completion for QSIG or EuroISDN on Primary Rate Interface.

2 LD 16 – Configure Remote Capability to Call Completion QSIG or EuroISDN on Basic Rate Interface.

3 LD 10 – Add or Change Ring Again on Analog (500/2500 type) telephones.

4 LD 11 – Add or Change Ring Again on Meridian 1 proprietary telephones.

5 LD 57 – Define Ring Again Flexible Feature Codes (FFCs) and FFC Confirmation Tone.

6 LD 15 – Configure a Private Integrated Services Network Exchange (PINX) DN.

LD 17 – Configure Remote Capabilities to Call Completion for QSIG or EuroISDN on Primary Rate Interface.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	ADAN	Configuration Record.
- ADAN	CHG DCH x	Change D-channel.
...		
- IFC	xxxx	Interface type for route where xxxx is: ESGF = Interface ID for ETSI QSIG with GF capability. ISGF = Interface ID for ISO QSIG with GF capability. EURO = Interface ID for EuroISDN.

- - CNTY	xxx	Country. Prompted only when IFC = EURO. Where xxx is: ETSI = ETS 300 102 basic protocol (default). GER = Germany. DEN = Denmark. NET = Master Mode. SWI = Switzerland.
...		
- RCAP	CCBS	Add Call Completion to Busy Subscriber as remote capability.
- RCAP	CCNR	Add Call Completion No Response. This prompt is only applicable to QSIG interfaces.

LD 16 – Configure Remote Capability to Call Completion QSIG or EuroISDN on Basic Rate Interface.

Prompt	**Response**	**Description**
REQ	CHG	Change.
TYPE	RDB	Route Data Block.
...		
DTRK	YES	Digital Trunk Route.
- DGTP	BRI	Basic Rate Interface. Allowed if TKTP = TIE, COT, or DID.
...		
-IFC	xxxx	Interface type for route where xxxx is: ESGF = Interface ID for ETSI QSIG with GF capability. ISGF = Interface ID for ISO QSIG with GF capability. EURO = Interface ID for EuroISDN.
- - CNTY	xxx	Country. Prompted only when IFC = EURO. Where xxx is: ETSI = ETS 300 102 basic protocol (default). GER = Germany. DEN = Denmark. NET = Master Mode. SWI = Switzerland.

...		
- RCAP	CCBS	Add Call Completion to Busy Subscriber as a remote capability. The response XCCBS removes this capability.
- RCAP	CCNR	Add Call Completion No Response as a remote capability. This prompt is only applicable to QSIG interfaces.

LD 10 – Add or Change Ring Again on Analog (500/2500 type) telephones.

Prompt	Response	Description
REQ:	CHG NEW	Change, or Add.
TYPE:	500	Telephone type.
TN	l s c u	Terminal Number.
	c u	For Option 11C.
...		
CLS	XRA	Ring Again allowed. XRD = Ring Again denied (default).

LD 11 – Add or Change Ring Again on Meridian 1 proprietary telephones.

Prompt	Response	Description
REQ:	CHG NEW	Change, or Add.
TYPE:	aaaa	Telephone type where aaaa = SL1, 2006, 2008, 2009, 2016, 1018, 2112, 2216 2317, 2616 or 3000.
TN	l s c u	Terminal Number.
	c u	For Option 11C.
...		
KEY	xx RGA	Assign Ring Again key where xx = key number. On M2317 and M3000 telephones xx = 27.

LD 57 – Define Ring Again Flexible Feature Codes (FFCs) and FFC Confirmation Tone.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	FFC	Flexible Feature Code.
CUST	xx	Customer number.
FFCT	YES	Confirmation tone provided after FFC is activated. NO = Confirmation tone not provided.
CODE	RGAA	Ring Again activate.
RGAA	xx	Ring Again code.
CODE	RGAD	Ring Again deactivate.
RGAD	xx	Ring Again deactivation code.
CODE	RGAV	Ring Again verification.
RGAV	xx	Ring Again verification code.

LD 15 – Configure a Private Integrated Services Network Exchange (PINX) DN.

Prompt	Response	Description
REQ:	CHG	Change.
TYPE:	NET	Networking.
CUST	xx	Customer number.
- PINX_DN	xx...x	Node DN to a maximum of seven digits with DN extension.

Feature operation

Call Completion on Busy Subscriber

Meridian 1 Proprietary Sets

1 Set A calls Set B on an outgoing QSIG/EuroISDN route and receives a busy indication.

2 Before releasing this call, Set A presses the Ring Again key (RGA) to activate Ring Again functionality. The DN lamp flashes.

3 When the far end receives a Call Completion on Busy Subscriber (CCBS) request, Set A's RGA lamp key is steadily lit, and the DN lamp darkens.

4 Set A awaits notification that Set B is free. Set A can make or receive calls while waiting for notification.

5 When Set B goes on-hook, Set A is notified in the form of a one second burst of ringing and the RGA key lamp fast flashes.

6 The recall is accepted by selecting the DN key and pressing the RGA key. Set A has thirty seconds to accept the recall before it is cancelled.

7 If Set A accepts the recall and Set B is free, the call is rung. However, if Set B has either received or originated another call, Set A receives a busy indication. Set A has the option of requesting CCBS again.

Note: If Set A presses the RGA key before receiving notification then the request is cancelled.

Analog (500/2500 type) sets without RGA key

1 Set A calls Set B on an outgoing QSIG/EuroISDN route and receives a busy indication.

2 Set A performs a switch-hook flash and a special dial tone is heard.

3 Set A dials RGA Activate Flexible Feature Code (FFC) or SPRE +1 to activate CCBS feature. This request cancels and replaces previous RGA Activate requests.

4 If an FFC is dialed, an FFC confirmation tone if programmed indicates that the CCBS request is registered.

5 Set A goes on-hook and is free to make or receive other calls.

6 When Set B goes on-hook, Set A receives a burst of tone and has thirty seconds to accept the recall before it is cancelled.

7 If Set B has originated or received another call, Set A receives a busy indication and has the option of requesting the CCBS again.

Note: If Set A presses the RGA key before receiving notification then the request is cancelled.

Call Completion No Response

Meridian 1 Proprietary Sets

1 Set A calls Set B on an outgoing QSIG route. The call rings but is not answered. Set A receives a ringback tone.

2 Set A presses RGA key to activate Ring Again on No Answer prior to releasing the call. The DN key lamp darkens.

3 Set A goes on-hook and is free to make or receive calls.

4 When Set B makes a call and goes on-hook. Set A is notified by a one second burst of tone and the RGA lamp fast flashes.

5 Set A can accept the call by selecting a DN key and pressing the RGA key. Set A has thirty seconds to accept this call.

6 If Set A accepts the call and Set B is free, the call goes through. However, if Set B receives or originates another call, Set A receives a busy indication. Set A has the option of requesting CCBS.

Note: If Set A presses the RGA key before receiving notification then the request is cancelled.

ISDN QSIG/EuroISDN Call Completion Enhancement

Contents

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Regional material statement

ISDN BRI trunking is not available in North America. Contact your system supplier or your Nortel Networks representative to verify support of this product in your area.

Feature description

The ISDN QSIG/EuroISDN Call Completion was introduced, to provide Call Completion to a Busy Subscriber (CCBS) over QSIG and EuroISDN networks, and Call Completion on No Response (CCNR) over QSIG networks.

- **Call Completion to a Busy Subscriber (CCBS).** This service allows a calling party to apply a Ring Again request to a called party that is busy. When the busy party becomes free, the calling party receives notification and can complete the call without making a new call attempt.
- **Call Completion on No Response (CCNR).** This service allows a calling party to apply a Ring Again request to a called party that is idle, and does not answer. The calling party receives notification after the Meridian 1 notices subsequent activity on the called extension, that has again become idle.

With enhancement, the QSIG/EuroISDN Call Completion Enhancement feature introduces the following functionalities:

- allows the method of Operation Coding for the CCBS and CCNR Supplementary Services to be configured by Object Identifier, used for European Telecommunications Standard Institute (ETSI) interfaces, or by Integer Value, used for International Standards Organization (ISO) interfaces. The Operation Coding method is configured as a remote capability using the RCAP prompt for an ISDN PRI D-Channel for ISDN PRI, or for an ISDN BRI route for ISDN BRI trunking.
- supports all ETSI/QSIG to MCDN and DPNSS1 gateways.
- allows all EuroISDN countries to fully support the QSIG/EuroISDN Call Completion services.

Operating parameters

Call Completion to a Busy Subscriber (CCBS) is available only on EuroISDN interfaces supporting the ETSI QSIG Generic Functional Protocol Transport.

Call Completion to a Busy Subscriber (CCBS) is not supported on ISDN BRI sets.

The QSIG/EuroISDN Call Completion Enhancement feature cannot use route access codes. The feature can only use a Coordinated Dialing Plan or Uniform Dialing Plan. Also, this feature does not support digit manipulation tables.

Since Ring Again is configured on a per-set basis, using Class of Service for analog (500/2500) sets or defining a Ring Again key on Meridian proprietary sets, it is not possible to configure a set so that Call Completion to a Busy Subscriber is denied for EuroISDN interfaces, and MCDN Network Ring Again is allowed.

Call completion on QSIG uses two signaling types, Connection Retention, where the signaling connection remains established until call completion is achieved, or the call completion attempt is cancelled, and Connection Release, where the signaling connection is cleared after each phase of call signaling, and a new signaling connection is established for each subsequent phase of call independent signaling. At the terminating side of the call connection, both signaling methods are mandatory, and are supported by the Meridian 1. At the originating side, although both methods are possible, the Meridian 1 supports only the Connection Retention type, since it matches the EuroISDN signaling.

A call completion recall over a QSIG interface uses two methods of establishing the recall, Path Reservation, where a bearer connection between the originating and terminating sides is established before presenting the recall to the originating party, in order to avoid network congestion, and Non-path Reservation, where a bearer connection between the originating and terminating sides is established after the originating party answers the recall, and the recall attempt is cancelled if network congestion is encountered. At the terminating side of the call connection, both methods of recall are mandatory, and are supported by the Meridian 1. At the originating side, although both methods are possible, the Meridian 1 supports only the Non-path Reservation method, since it is used by MCDN and EuroISDN. Also, the Path Reservation method is not supported over QSIG to MCDN or DPNSS1 gateways.

For a QSIG or EuroISDN call completion attempt, if the called party is found to be again busy after the originating party responds to a call completion recall, there are two methods of behavior that the Meridian 1 may take. With the Request Retention method, the call completion request remains in place at both the originating and terminating side. The terminating side begins monitoring the terminating party. With the Service Cancellation method, the call completion request is cancelled at both the originating and terminating sides. The Request Retention method is not supported on the Meridian 1.

Busy name information sent with a DISCONNECT message is only supported for Overlap Receiving (the OVLR prompt is set to YES in LD 17).

Feature interactions

Access Restrictions/trunk Group Access Restrictions

QSIG/EuroISDN Call Completion cannot override access restrictions placed on a call. The second call due to either CCBS or CCNR is under the same access restrictions as the first call.

Advice of Charge for EuroISDN

The Advice of Charge for EuroISDN applies to both the first call and second call due to CCNR. The second call receives the same call charging information as the first call (that is, as a normal call).

Attendant Console

A CCBS or CCNR cannot originate from, or terminate to, an attendant console.

Automatic Call Distribution

A CCBS or CCNR cannot originate from, or terminate to, an ACD Directory Number.

Call Connection Restriction

QSIG/EuroISDN Call Completion cannot override call connection restrictions placed on a call. The second call due to either CCBS or CCNR is under the same call connection restrictions as the first call.

Call Detail Recording

There is no CDR information created for a CCBS attempt. A new call that is established as part of CCBS is subject to CDR, as per a normal call.

Call Forward

When a CCBS or CCNR request is received on a set which has been call forwarded, the CCBS or CCNR request is registered against the DN to which the set has been forwarded.

Call Transfer

Call Completion free notification can only be presented to the originating station, and cannot be transferred to another station. However, once the call has been established, it behaves as a normal call, with respect to call transfer.

During a call transfer operation, a caller that encounters a busy or no answer situation, can still activate the call transfer.

A call cannot be completed that is being transferred to a busy destination, as part of the EuroISDN Continuation feature, or to a no answer destination.

Call Waiting

A Call Completion free notification is presented to an analog (500/2500) set after an active call has been completed. If there is a call waiting on the set, the Call Completion free notification is presented to the set after the call waiting call has been completed. If another call waiting occurs while a Ring Again free notification is waiting on the set, the new call waiting presentation takes precedence.

A Call Completion call may wait to be established on a set that is busy on another call, and has the Call Waiting feature activated.

Conference

A Call Completion request cannot be made as part of a conference call attempt.

Customer Controlled Routing

A Call Completion attempt request be applied to a Customer Controlled Routing DN.

Direct Inward System Access

CCBS cannot be applied to DISA calls when the terminating party is busy. CCNR cannot be applied to DISA calls when the terminating party does not answer.

Directory Number - Multiple Appearance Directory Number Redirection Prime

MARP does not apply to a Call Completion attempt.

Do Not Disturb

Stations with the Do Not Disturb feature active may make Call Completion requests against other stations, subject to the same restrictions as if the feature were not active. The incoming Call Completion free notification overrides the Do Not Disturb state.

Flexible Numbering Plan

A Flexible Numbering Plan may be used with QSIG/EuroISDN Call Completion, as long as the numbering plan is consistent over the network.

Group Call

A Call Completion request cannot be applied to a group call.

Group Hunt

CCBS cannot be applied to a PLDN when no idle set is found during a group hunt call.

Hot Line

A Call Completion request cannot be used in conjunction with the Hot Line or Enhanced Hot Line feature.

Initialize

If a system initialize occurs at a Meridian 1, all Call Completion requests at the Meridian 1 are deleted. If the requesting party is not on the Meridian 1 which has initialized, it is not notified that a Call Completion request has been cancelled.

Maintenance Busy

A Call Completion request cannot be made against a set in maintenance busy state.

Make Set Busy

If a set with Make Set Busy active makes a Call Completion request to another station, then the Call Completion free notification overrides the Make Set Buy state. Incoming CCBS requests, however, do not override the Make Set Busy state. A CCBS request can only be completed once Make Set Busy is deactivated.

Permanent Hold

Analog (500/2500) sets with a call on permanent hold cannot use the Ring Again feature.

Pretranslation

Pretranslation may be used in conjunction with a Call Completion request.

Ring Again/Ring Again No Answer

Analog (500/2500) sets can only have one Call Completion request active at a time. Meridian proprietary sets may make as many Call Completion requests as available keys to support the requests.

Ring Again Inhibition

Ring Again cannot be activated if a limit of 12.5% of all available call registers in the Ring Again queues is exceeded.

DPNSS1 Call Back When Free and Next Used

In a QSIG/EuroISDN to DPNSS1 gateway, a caller on one node can activate Ring Again to any other destination party at another node, using a combination of QSIG/EuroISDN and DPNSS1 links.

Electronic Switched Network

QSIG/EuroISDN Call Completion uses a Uniform Dialing Plan or Coordinated Dialing Plan Numbering Plan.

The use of the Connection Retention procedure (refer to the relevant discussion on page 1044, as part of the ‘Operating parameters’ section) on QSIG does not require that the Numbering Plan be symmetrical (although this approach is not recommended). The called destination, which is being monitored as part of CCBS or CCNR, does not require notification as how to connect to the originating party.

This only applies if the Connection Retention procedure is used. If the Connection Release procedure is used, the numbering plan has to be symmetrical, so that the destination party can use the CLID of the originating party, to send the Call Connection free notification.

Hunting and Group Hunting

Hunting and Group Hunting is not supported by the QSIG/EuroISDN Call Completion feature.

ISDN Basic Rate Interface

QSIG/EuroISDN Call Completion is not supported on ISDN BRI sets. CCBS and CCNR cannot neither be activated or received on a ISDN BRI set.

Network Call Redirection - EuroISDN

If a call over a EuroISDN interface has not been locally call forwarded, then a Call Completion request is ignored.

Network Call Redirection - QSIG Diversion

Call Completion to Busy Subscriber

If CCBS is invoked on a busy destination that has been diverted over a QSIG interface, the originating Private Integrated Services Network Exchange (PINX) stores the diverted-to number issued by the served PINX, to use it for CCBS call treatment. This diverted-to number is used as received, without any digit manipulation.

Call Forward Unconditional and Call Forward Busy take precedence over CCBS.

Call Completion on No Reply

If CCNR is invoked on a destination that does not answer, and that has been diverted over a QSIG interface, the originating Private Integrated Services Network Exchange (PINX) stores the diverted-to number issued by the served PINX, to use it for CCNR call treatment. This diverted-to number is used as received, without any digit manipulation.

Call Forward No Reply takes precedence over CCNR.

Feature packaging

The following packages are required for the **QSIG** component of the QSIG/EuroISDN Call Completion Enhancement feature:

For ISDN PRI:

- Ring Again (RGA) package 1
- Digit Display (DDSP) package 19
- Integrated Services Digital Network (ISDN) package 145
- Primary rate Access (PRI) package 146
- 2.0 Mb Primary Rate Access (PRI2) package 154
- Flexible Numbering Plan (FNP) package 160
- Overlap Signaling (OVLP) package 184 (optional)
- International Primary Rate Access (IPRA) package 202
- Multi-purpose Serial Data Link (MSDL) package 222
- Q-reference Signaling Point Interface (QSIG) package 263
- QSIG Generic Functional Protocol Transport (QSIG-GF) package 305
- QSIG Supplementary Services (QSIG-SS) package 316
- Coordinated Dialing Plan (CDP) package 59, and one of the following:
- Network Alternate Route Selection (NARS) package 58, **or** Basic Alternate Route Selection (BARS) package 57

For ISDN BRI trunking:

- Digit Display (DDSP) package 19
- Integrated Services Digital Network (ISDN) package 145
- Overlap Signaling (OVLP) package 184 (optional)
- ISDN Basic rate Access (BRI) package 216
- ISDN Basic Rate Trunk Access (BRIT) package 233
- Q-reference Signaling Point Interface (QSIG) package 263

The following packages are required for the **EuroISDN** component of the QSIG/EuroISDN Call Completion Enhancement feature:

For ISDN PRI2:

- Ring Again (RGA) package 1
- Digit Display (DDSP) package 19
- Coordinated Dialing Plan (CDP) package 59 or Network Alternate Route Selection (NARS) package 58, **or** Basic Alternate Route Selection (BARS) package 57
- Integrated Services Digital Network (ISDN) package 145
- 2.0 Mb Primary Rate Access (PRI2) package 154
- Network Attendant Service (NAS) package 159 (for MCDN to EuroISDN gateways)
- Flexible Numbering Plan (FNP) package 160
- ISDN International Supplementary Features (ISDN SUPP) package 161
- Overlap Signaling (OVLP) package 184 (optional)
- International Primary Rate Access (IPRA) package 202
- Multi-purpose Serial Data Link (MSDL) package 222
- ETSI Supplementary Services (ETSI-SS) package 323

For ISDN BRI trunking:

- Digit Display (DDSP) package 19
- Integrated Services Digital Network (ISDN) package 145
- ISDN International Supplementary Features (ISDN SUPP) package 161
- Overlap Signaling (OVLP) package 184 (optional)
- International Primary Rate Access (IPRA) package 202
- ISDN Basic rate Access (BRI) package 216
- ISDN Basic Rate Trunk Access (BRIT) package 233
- ETSI Supplementary Services (ETSI-SS) package 323

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 17 – Configure the method of Operation Coding for the Call Completion to a Busy Subscriber.

2 LD 17 – Configure the method of Operation Coding for the Call Completion to a Busy Subscriber supplementary service, for the associated QSIG or EuroISDN D-Channel.

3 LD 17 – Configure the method of Operation Coding for the Call Completion on No Reply supplementary service, for the associated QSIG D-Channel.

4 LD 10 – Configure Ring Again Class of Service on analog (500/2500) sets.

5 LD 15 – Configure a Special Prefix Number (SPRE) for a customer.

6 LD 15 – Configure the Ring Again on No Answer and Call Completion on No Response (CCNR) option, and a Private Integrated Services Network Exchange (PINX) node Directory Number.

7 LD 57 – Configure the Flexible Feature Code for Calling Private Privacy, and define whether Flexible Feature Code confirmation tone is to be provided.

8 LD 17 – Configure Network Attendant Service on an MCDN D-Channel.

9 LD 16 – Configure the method of Operation Coding for the Call Completion to a Busy Subscriber supplementary service, for the associated QSIG or EuroISDN BRI trunk route.

10 LD 16 – Configure the method of Operation Coding for the Call Completion on No Reply supplementary service, for the associated QSIG ISDN BRI trunk route.

This section contains the procedures required to configure the Call Completion to a Busy Subscriber (CCBS) over QSIG and EuroISDN networks, and Call Completion on No Response (CCNR) over a QSIG network, on a Meridian 1 PBX.

For ISDN PRI:

- Configure the method of Operation Coding for the Call Completion to a Busy Subscriber supplementary service, for the associated QSIG or EuroISDN D-Channel, using LD 17.
- Configure the method of Operation Coding for the Call Completion on No Reply supplementary service, for the associated QSIG D-Channel., using LD 17.
- Configure Ring Again Class of Service on analog (500/2500) sets, using LD 10.
- Configure a Special Prefix Number (SPRE) for a customer, using LD 15.
- Configure the Ring Again on No Answer and Call Completion on No Response (CCNR) option, and a Private Integrated Services Network Exchange (PINX) node Directory Number, using LD 15.
- Configure the Flexible Feature Code for Calling Private Privacy, and define whether Flexible Feature Code confirmation tone is to be provided, using LD 57.
- Configure Network Attendant Service on an MCDN D-Channel, using LD 17.

For ISDN BRI:

- Configure the method of Operation Coding for the Call Completion to a Busy Subscriber supplementary service, for the associated QSIG or EuroISDN BRI trunk route, using LD 16.
- Configure the method of Operation Coding for the Call Completion on No Reply supplementary service, for the associated QSIG ISDN BRI trunk route, using LD 16.

ISDN PRI implementation

LD 17 – Configure the method of Operation Coding for the Call Completion to a Busy Subscriber.

Note 1: When configuring the interface type, please consider the following. In order to support countries that have not yet upgraded to the ETS 300 403 standard (as introduced by the EuroISDN ETS 300 403 Compliance Update feature), the Meridian 1 still interworks with Central Offices conforming to the ETS 300 102 standard. So, when programming the D-Channel for PRI2 trunks (in LD 17) or a PRI2 route for ISDN trunks (in LD 16) for an ETS 300 403 interface, the following applies:

- If IFC = E403 and CNTY = ETSI (ETS 300 403 for the user side) or NET (ETS 300 403 for the network side), then the interface is fully compliant with ETS 300 403.
- If IFC = E403 and CNTY = any of the supported country entries except ETSI and NET, then the interface behaves like an ETS 300 102 extended version, that is, in addition to the existing ETS 300 102 capabilities, the bearer capability and High Layer Compatibility selection procedures (fall-back mechanism), and the basic telecommunication service identification are also implemented in order to take advantage of new teleservices, such as 7kHz telephony and Videotelephony.

  Also note that a user may still configure an interface fully compliant with the ETS 300 102 standard if IFC = EURO and CNTY = any of the supported country values.

Note 2: Consider the following when configuring the method of Operation Coding for a QSIG interface. When the QSIG interface is ISO (IFC = ISGF), operations are mostly coded with Integer Values (RCAP = CCBI or CCNI). For ETSI interfaces (IFC = ESGF), the operation coding depends on the standard version. The current versions are likely to use Integer Values (RCAP = CCBI or CCNI), whereas some older versions may use Object Identifies (RCAP = CCBO or CCNO).

LD 17 – Configure the method of Operation Coding for the Call Completion to a Busy Subscriber supplementary service, for the associated QSIG or EuroISDN D-Channel.

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	ADAN	Action Device and Number.
- ADAN	NEW DCH xx	Add a D-Channel on port 0-63, for Options 51C-81C.
	NEW DCH xx	Add a D-Channel on port 0-14, for Option 11C.
...		
- IFC	ESGF ISGF EURO E403	ETSI QSIG interface with GF platform. ISO QSIG interface with GF platform. EuroISDN. EuroISDN Interface conforming to the ETS 300 403, or the extended ETS 300 102 version for country-specific interfaces. See Note 1 on page 1055.
- - CNTY		Enter country pertaining to the E403 interface. If either ETSI or NET are entered, the interface is fully compliant with ETS 300 403. See Note 1 on page 1055.
	ETSI NET	ETS 300 403 for the user side. ETS 300 403 for the network side.
		If any of the countries listed on the following page are entered, the interface functions with the extended ETS 300 102 capabilities. See Note 1 on page 1055.

		Enter country pertaining to EuroISDN interface (this prompt is generated if IFC = EURO).
	AUS	Austria.
	DEN	Denmark.
	(ETSI)	ETS 300-102 basic protocol.
	FIN	Finland.
	GER	Germany.
	ITA	Italy.
	NOR	Norway.
	POR	Portugal.
	SWE	Sweden.
	EIR	Ireland.
	DUT	Holland.
	SWI	Switzerland.
	BEL	Belgium.
	ESP	Spain.
	UK	United Kingdom.
	FRA	France.
	CIS	Commonwealth of Independent States (Russia and the Ukraine).
...		
- RCAP		Enter the Operation Coding method for the QSIG/ETSI CCBS supplementary service.
	CCBO	Coding by Object ID.
	CCBI	Coding by Integer Value.
	XCCB	Remove the CCBO or CCBI value.
		Note: CCBO and CCBI are mutually exclusive.
...		

LD 17 – Configure the method of Operation Coding for the Call Completion on No Reply supplementary service, for the associated QSIG D-Channel.

The value is configured as a remote capability. It may be either by Object Identifier, used for ETSI, or by Integer Value, used for ISO.

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	ADAN	Action Device and Number.

- ADAN	NEW DCH xx	Add a D-Channel on port 0-63, for Options 51C-81C.
	NEW DCH xx	Add a D-Channel on port 0-14, for Option 11C.
...		
- IFC	ESGF ISGF	ETSI QSIG interface with GF platform. ISO QSIG interface with GF platform.
...		
- RCAP		Enter the Operation Coding method for the QSIG CCNR supplementary service.
	CCNO CCNI XCCN	Coding by Object ID. Coding by Integer Value. Remove the CCBO or CCBI value.
		Note: CCNO and CCNI are mutually exclusive.
...		

LD 10 – Configure Ring Again Class of Service on analog (500/2500) sets.

Prompt	Response	Description
REQ:	NEW CHG	Add new data. Change existing data.
TYPE:	500	Type of set.
TN	 l s c u	Terminal Number address, for Option 51C-81C. l = loop, s = shelf, c = card, u = unit.
	 c u	Terminal Number address, for Option 11C. c = card, u = unit.
DES	d...d	Office Data Administration System (ODAS) Station Designator, 1-6 alphanumeric characters.
CUST	xx	Customer number, as defined in LD 15. xx = 0-99 for Option 51C-81C. xx = 0-31 for Option 11C.
CLS	(XRD) XRA	Deny or allow Ring Again Class of Service.
...		

LD 15 – Configure a Special Prefix Number (SPRE) for a customer.

Prompt	Response	Description
REQ:	CHG	Change existing data.
TYPE:	FTR	Features and options data.
CUST	xx	Customer number. xx = 0-99 for Options 51C-81C. xx = 0-31 for Option 11C.
...		
SPRE	xxxx	Special Prefix Number (xxxx = 1-4digits).
...		

LD 15 – Configure the Ring Again on No Answer and Call Completion on No Response (CCNR) option, and a Private Integrated Services Network Exchange (PINX) node Directory Number.

Prompt	Response	Description
REQ:	CHG	Change existing data.
TYPE:	NET	Networking data.
CUST	xx	Customer number. xx = 0-99 for Options 51C-81C. xx = 0-31 for Option 11C.
OPT	(RND) RNA	Deny or allow Ring Again on No Answer or Call Completion on No Response.
ISDN	YES	Integrated Services Digital Network.
...		
- PINX_DN	xx...x	Private Integrated Services Network Exchange node Directory Number (up to seven digits). Precede the existing value with an X to delete it. If the Call Completion to a Busy Subscriber (CCBS) service does not provide CLID to the MCDN or DPNSS1 gateway, the PINX_DN is used to build the calling number. On an incoming CCBS request, the PINX_DN is used to determine the length of the DN extension.
...		

LD 57 – Configure the Flexible Feature Code for Calling Private Privacy, and define whether Flexible Feature Code confirmation tone is to be provided.

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	FFC	Flexible Feature Code data.
CUST	xx	Customer number, as defined in LD 15. xx = 0-99 for Options 51C-81C. xx = 0-31 for Option 11C.
FFCT	(NO) YES	(Do not) provided FFC confirmation tone after the FFC is dialed.
CODE	RGAA	The type of FFC is Ring Again Activate.
- RGAA	xxxx	Enter the Ring Again Activate FFC.
CODE	RGAA	The type of FFC is Ring Again Activate.
- RGAD	xxxx	Enter the Ring Again Deactivate FFC.
CODE	RGAA	The type of FFC is Ring Again Activate.
- RGAV	xxxx	Enter the Ring Again Verify FFC.
...		

LD 17 – Configure Network Attendant Service on an MCDN D-Channel.

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	ADAN	Action device and number.
- ADAN	CHG DCH xx	Change a D-channel on logical port 0-63, for Options 51C-81C.
	CHG DCH xx	Change a D-channel on logical port 0-15, for Option 11C.
...		
- IFC	SL1	MCDN interface.
...		
- NASA	YES	Allow Network Attendant Service.
...		

ISDN BRI implementation

LD 16 – Configure the method of Operation Coding for the Call Completion to a Busy Subscriber supplementary service, for the associated QSIG or EuroISDN BRI trunk route.

Prompt	Response	Description
REQ	NEW	Add new data (ISDN BRI protocol group settings).
TYPE	RDB	Route Data Block.
CUST	xx	Customer number, already defined in LD 15. xx = 0-99 for Options 51C-81C xx = 0-31 for Option 11C.
ROUT	0-511 0-127	Route number, for Options 51C-81C. For Option 11C.
TKTP	aaa	Trunk type.

DTRK	YES	Digital Trunk Route.
BRIP	NO	ISDN BRI packet handler route (NO is entered, since packet data is not required).
- DGTP	BRI	Digital trunk type.
ISDN	YES	Integrated Services Digital Network.
...		
- IFC	ESGF ISGF EURO E403	ETSI QSIG interface with GF platform. ISO QSIG interface with GF platform. EuroISDN. EuroISDN Interface conforming to the ETS 300 403, or the extended ETS 300 102 version for country-specific interfaces. See Note 1 on page 1055.
- - CNTY		Enter country pertaining to the E403 interface. If either ETSI or NET are entered, the interface is fully compliant with ETS 300 403. See Note 1 on page 1055.
	ETSI NET	ETS 300 403 for the user side. ETS 300 403 for the network side.
		If any of the countries listed on the following page are entered, the interface functions with the extended ETS 300 102 capabilities. See Note 1 on page 1055.

		Enter country pertaining to EuroISDN interface (this prompt is generated if IFC = EURO).
	AUS DEN (ETSI) FIN GER ITA NOR POR SWE EIR DUT SWI BEL ESP UK FRA CIS	Austria. Denmark. ETS 300-102 basic protocol. Finland. Germany. Italy. Norway. Portugal. Sweden. Ireland. Holland. Switzerland. Belgium. Spain. United Kingdom. France. Commonwealth of Independent States (Russia and the Ukraine).
...		
RCAP		Enter the Operation Coding method for the QSIG/ETSI CCBS supplementary service.
	CCBO CCBI XCCB	Coding by Object ID. Coding by Integer Value. Remove the CCBO or CCBI value. ***Note:*** CCBO and CCBI are mutually exclusive.
...		

LD 16 – Configure the method of Operation Coding for the Call Completion on No Reply supplementary service, for the associated QSIG ISDN BRI trunk route.

Prompt	Response	Description
REQ	NEW	Add new data (ISDN BRI protocol group settings).
TYPE	RDB	Route Data Block.

CUST	xx	Customer number, as defined in LD 15. xx = 0-99 for Options 51C-81C xx = 0-31 for Option 11C.
ROUT	0-511 0-127	Route number, for Options 51C-81C. For Option 11C.
TKTP	aaa	Trunk type.
DTRK	YES	Digital Trunk Route.
BRIP	NO	ISDN BRI packet handler route (NO is entered, since packet data is not required).
- DGTP	BRI	Digital trunk type.
ISDN	YES	Integrated Services Digital Network.
...		
- IFC	ESGF ISGF	ETSI QSIG interface with GF platform. ISO QSIG interface with GF platform.
...		
RCAP		Enter the Operation Coding method for the QSIG CCNR supplementary service.
	CCNO CCNI XCCN	Coding by Object ID. Coding by Integer Value. Remove the CCBO or CCBI value.
		Note: CCNO and CCNI are mutually exclusive.
...		

Feature operation

No operating procedures are required to use this feature.

ISDN QSIG Generic Functional Transport

Contents

The following are the topics in this section:

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Feature description 1067
Operating parameters 1068
Feature interactions 1068
Feature packaging 1068
Feature implementation 1069
Task summary list 1069
Feature operation 1070

Regional material statement

ISDN BRI trunking is not available in North America. Contact your system supplier or your Nortel Networks representative to verify support of this product in your area.

Feature description

This feature provides a generic transport platform that will support QSIG compliant supplementary services and ISDN networking applications on a Private Integrated Services Digital Network (PISN), in accordance with the International Standards Organization (ISO) and the European Telecommunication Standards Institute (ETSI.)

ISDN QSIG GF Transport is supported on the following interfaces with the D-channel configured as International Standards Organization (ISO QSIG) or European Telecommunications Standard Institute (ETSI QSIG):

- ISDN 1.5 Mbps Primary Rate Interface (PRI),
- ISDN 2 Mbps Primary Rate Interface (PRI2),
- ISDN Basic Rate Interface (BRI) Trunk, and
- ISDN Signaling Link (ISL).

Operating parameters

DN address translation requires the association with a customer number. For a BRI trunk Digital Subscriber Loop (DSL) interface, the customer number association is with the D-channel. For PRI, a prompt creates a customer number association with a given D-channel.

Feature interactions

There are no feature interactions specified for this feature.

Feature packaging

The following packages are required for ISDN QSIG GF Transport:

- ISDN QSIG GF Transport (QSIGGF) is package 305.

QSIG on the ISDN PRI interface requires the following packages:

- Integrated Services Digital Network (ISDN) package 145;
- Primary Rate Access (PRI) package 146;
- 2.0 Mb Primary Rate Interface (PRI2) package 154;
- International Primary Rate Access (IPRA) package 202;
- Multi-purpose Serial Data Link (MSDL) package 222;
- QSIG Interface (QISG) package 263;
- QSIG GF Transport (QSIGGF) package 305.

ISDN Signaling Link (ISL) interface requires the following packages:

- Integrated Service Digital Network Signaling Link (ISL) package 147;

- Multi-purpose Serial Data Link (MSDL) package 222;
- QSIG Interface (QSIG) package 263;
- QSIG GF Transport (QSGIGF) package 305.

For ISL shared mode:

- Integrated Services Digital Network (ISDN) package 145;
- Primary Rate Access (PRI) package 146;
- 2.0 Mb Primary Rate Interface (PRI2) package 154.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 16 – Configure the Route Data Block.

2 LD 17 – Configuration Record.

LD 16 – Configure the Route Data Block.

Prompt	Response	Description
REQ	NEW CHG	New, or change.
TYPE	RDB	Route Data Block.
...		
DTRK	YES	Digital Trunk Route.
...		
DGTP	PRI PRI2 BRI	1.5 Mbit PRI. 2.0 Mbit PRI. Basic Rate Interface.
IFC	ESGF ISGF	ESGF = ETSI QSIG interface with GF platform. ISGF = ISO QSIG interface with GF platform. The ESIG and ISIG prompt can be entered if both QSIG and QSIGGF packages are included.

LD 17 – Configuration Record.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	ADAN	Action Device and Number.
ADAN	aaa aaa x	Add, Move or Change Input/Output Device
...		
- IFC	ESGF ISGF	ESGF = ETSI QSIG interface with GF platform. ISGF = ISO QSIG interface with GF platform.
PINX_CUST	xx	Customer number.
ISDN_MCNT	60-(300)-350	Layer 3 call control message count five per second time interval.

Feature operation

There are no operating procedures specified for this feature.

ISDN QSIG Name Display

Contents

The following are the topics in this section:

Regional material statement 1071
Feature description 1071
Calling Name Identification Presentation 1072
Connected Name Identification Presentation 1072
Calling/Connected Name Identification Restriction 1072
Operating parameters 1072
Feature interactions 1073
Feature packaging 1075
Feature implementation 1076
Task summary list 1076
Feature operation 1082

Regional material statement

ISDN BRI trunking is not available in North America. Contact your system supplier or your Nortel Networks representative to verify support of this product in your area.

Feature Description

The Integrated Services Digital Network (ISDN) Q Reference Signaling Point (QSIG) Name Display feature provides three supplementary services pertaining to the calling or connected party name display. These supplementary services allow the calling/connected party to either present or restrict the display of name identification on an ISDN PRI or ISDN BRI link.

ISDN QSIG Name Display feature supports the following services:

- Calling Name Identification Presentation (CNIP),
- Connected Name Identification Presentation (CONP), and
- Calling/Connected Name Identification Restriction (CNIR).

Calling Name Identification Presentation

Calling Name Identification Presentation (CNIP) service is available to the called/connected party. When this service is enabled, the calling party's name is displayed on the connected party's set. CNIP service is available on a permanent basis only, and requires the calling party to have the Class of Service Name Presentation Allowed, defined in LD 10 or LD 11.

Connected Name Identification Presentation

Connected Name Identification Presentation (CONP) is a service available to the calling party. When this service is enabled, the called/connected party's name is displayed on the calling party's set. CONP is provided on a permanent basis only and requires the called/connected party to have the Class of Service Name Presentation Allowed, defined in LD 10 or LD 11.

Calling/Connected Name Identification Restriction

Calling/Connected Name Identification Restriction (CNIR) prevents the calling/connected party's name from being presented to a called/calling party. CNIR is invoked on either a permanent basis, provided the calling/connected party has a Class of Service Name Presentation Denied defined in LD 10 or LD 11, or on a per-call basis. When CNIR is activated on a per-call basis, the Class of Service Name Presentation Allowed is configured, and Calling Party Privacy (CPP) Flexible Feature Code (FFC) is dialed prior to initiating a call. This supplementary service restricts presentation of the calling/connected party's name during a normal call establishment and also when the possibility of name presentation arises from the operation of other features, such as Call Transfer, Call Forwarding or Hunting.

Operating parameters

ISDN QSIG Name Display feature requires the QSIG General Functional (GF) transport platform. QSIG GF protocols provide name information that is contained in the facility information element. This protocol transports call control messages from one network to another.

Fifty characters string length is the maximum allowable size of name display information for QSIG. The Call Party Name Display (CPND) feature accepts 27 characters string length. If a name display exceeds these parameters, the name is truncated on the receiving set.

Interworking with existing Meridian Customer Defined Network (MCDN) Name Display feature is dependent upon the remote capability of the associated D-channel defined in LD 16 for BRI routes and LD 17 for PRI routes.

Individual service profiles cannot override Calling Name Identification Restriction requests. Therefore, when name display information has been restricted, it is not possible to obtain this information on the display of the set.

For ISDN BRI sets to have the capability to activate Calling/Connected Name Identification Restriction (CNIR) on a permanent basis, the PRES prompt in LD 27 must be defined PRES = NO.

Calling Party Privacy (CPP) Flexible Feature Codes (FFC) is not supported on BRI sets. Therefore, CNIR on a per-call basis is not supported on BRI sets.

Calling/Connected Name Identification Restriction (CNIR) takes precedence over Calling Name Identification Presentation (CNIP) and Connected Name Identification Presentation (CONP) services.

Feature interactions

Call Modification

If an incoming QSIG with name display presentation allowed receives call modification treatment, such as Call Pickup, Call Transfer, Conference, Call Forward All Types or Hunt, the reason for call modification is not displayed on the calling party's set. Name display information is not updated on the calling party's set. However, if a CONNECT message is sent, the calling party's name display is updated on receipt of this message.

Call Pickup

An incoming QSIG call with name display presentation allowed has name information displayed on the set that picks up the call. If the incoming QSIG call has presentation denied, the calling party's name is not displayed on the set picking up the incoming call.

Call Pickup Network Wide

When a QSIG call with name display presentation allowed is picked up on a MCDN, the calling party's name information is displayed on the set that answers the call. If presentation restricted is defined, then name information is not displayed.

Call Transfer

After the completion of a call transfer, an incoming QSIG call with name display presentation allowed has name information displayed on the destination set. If the incoming QSIG call has presentation denied, name information is not displayed to the destination set.

Call Transfer Network Wide

When a QSIG call with name display presentation allowed is transferred over a MCDN, the calling party's name information is displayed on the set that answers the call. If presentation restricted is defined, then name information is not displayed.

Conference

Conference Network Wide

An incoming QSIG call with name display presentation allowed is conferenced locally. When a conferee drops out of the conference, calling party's name information is displayed and is passed on to another conferee. Name display information remains until the last local set remains on the call.With presentation restricted, the calling party's name information is not displayed as conferees leave the call.

Call Forward All Calls

When an incoming QSIG call, with name display presentation allowed Name Display, is forwarded locally, the calling party's name information is displayed on the forwarding set. With presentation restriction, the calling party's name information is not displayed to the destination set.

Call Forward All Calls - Network Wide

When a QSIG call with name display presentation allowed is forwarded over a MCDN, the calling party's name information is displayed on the forwarded set. If presentation restricted is defined, then name information is not displayed on the destination set.

Call Party Name Display
Calling Party Name Display Denied

Call Party Name Display and Calling Party Name Display Denied interact with ISDN QSIG Name Display, depending on the Name Display configuration in LD 16 for BRI or LD 17 for PRI. When a QSIG network is interacting with an MCDN network providing network capability ND3, both the MCDN and QSIG Name Display feature function on the same level.

Calling Party Privacy

Calling Party Privacy (CPP) takes precedence over the ISDN QSIG Name Display feature.

Hunting

When an incoming QSIG call with name display presentation allowed is hunted locally, the calling party's name information is displayed on the destination set. With presentation restriction, the calling party's name information is not displayed.

Hunting - Network Wide

When a QSIG call with name display presentation allowed is forwarded over a MCDN, the calling party's name information is displayed on the forwarded set. If presentation restricted is defined, then name information is not displayed on the forwarded set.

Incoming DID Digit Conversion
Incoming DID Digit Conversion Network Wide

IDC trunk and name information is passed and displayed to the terminating party when no name information is received from the Direct Inward Dial (DID) trunk. The Incoming DID Digit Conversion (IDC) feature is activated, and name information is associated with the converted digit sequence.

Name information received from a DID trunk takes precedence over an IDC trunk name.

Feature packaging

ISDN QSIG Name Display requires the following packages:

- Digit Display (DDSP) package 19;
- Calling Party Name Display (CPND) package 95;

- International Supplementary Features (SUPP) package 131;
- Flexible Feature Codes (FFC) package 139;
- Calling Party Privacy (CPP) package 301;
- Integrated Services Digital Network (ISDN) package 145;
- Primary Rate Access (PRI) package 146;
- 2.0 Mb Primary Rate Interface (PRI2) package 154;
- International Primary Rate Access (IPRA) package 202;
- Multipurpose Serial Data Link (MSDL) package 222;
- ISDN Basic Call QSIG (QSIG) package 263; and
- QSIG GF Transport (QSIGGF) package 305.

The following packages are required for a Basic Rate Interface QSIG Interface:

- Integrated Services Digital Network (ISDN) package 145;
- Basic Rate Interface (BRI) package 216;
- Multipurpose Serial Data Link (MSDL) package 222;
- ISDN BRI Trunk Access (BRIT) package 233;
- ISDN Basic Call QSIG (QSIG) package 263; and
- QSIG GF Transport (QSIGGF) package 305.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 95 – Modify the Call Party Name Display (CPND) data block.

2 LD 10 – Define Class of Service Name Display Allowed on Analog (500/2500 type) sets.

3 LD 11 – Define Class of Service Name Display Allowed on Meridian 1 proprietary sets.

4 LD 12 – Define Class of Service Name Display Allowed on Attendant Consoles.

5 LD 27 – Define data for ISDN BRI sets.

6 LD 16 – QSIG BRI route configuration.

7 LD 16 – Configure Remote Capability for an MCDN BRI route.

8 LD 17 – Configure Remote Capability for QSIG D-channel.

9 LD 17 – Configure Remote Capability for MCDN D-channel.

10 LD 57 – Define the Calling Party Privacy Flexible Feature Code for Meridian 1 proprietary and Analog (500/2500 type) sets.

LD 95 – Modify the Call Party Name Display (CPND) data block.

Note: Call Party Name Display is also defined at the set level in either LD 10 or LD 11 depending on type of set.

Prompt	Response	Description
REQ	NEW	Create Call Party Name Display data block.
TYPE	CPND	Call Party Name Display data block.
CUST	xx	Customer number.
....		
REQ	NEW	Create new name strings.
TYPE	NAME	Name Strings.
CUST	xx	Customer number.
...		
DN	xxxx	Directory Number.

LD 10 – Define Class of Service Name Display Allowed on Analog (500/2500 type) sets.

Prompt	Response	Description
REQ:	NEW CHG	Add, or Change.
TYPE:	500	Type of telephone.
CUST	xx	Customer number.
...		
CLS	CNDA	Called Party Number Display Allowed. Allows called/connected party name to be viewed by calling party. (CNDD) = Call Number Display Denied (default).
CLS	NAMA	Name Display Allowed on the far end. (NAMD) = Name Display Denied (default).
FTR	CPND	Allow Call Party Name Display name assignment.

LD 11 – Define Class of Service Name Display Allowed on Meridian 1 proprietary sets.

Prompt	Response	Description
REQ:	NEW CHG	Add, or Change.
TYPE:	xxxx	Telephone type, where: xxxx = SL1, 2006, 2008, 2009, 2016, 2018, 2112, 2216, 2317, 2616 or 3000.
CUST	xx	Customer number.
...		
CLS	CNDA	Call Party Name Display Allowed. Allows display of original DN name on redirection. (CNDD) = Call Party Name Display Denied (default).

CLS	DNDA	Dialed Name Display Allowed. This displays the originally dialed DN Name on redirected calls. (DNDD) = Dialed Name Display Denied.
CLS	NAMA	Name Display Allowed on the far end (default). (NAMD) = Name Display Denied.

LD 12 – Define Class of Service Name Display Allowed on Attendant Consoles.

Prompt	Response	Description
REQ	NEW CHG	Add, or Change.
TYPE	xxxx	Console type where xxxx =1250 or 2250.
TN	l s c u	Terminal Number.
	c u	For Option 11C.
...		
CPND	CNDA	Call Party Name Display Allowed. (CNDD) = Call Party Name Display Denied (default).

LD 27 – Define data for ISDN BRI sets.

Prompt	Response	Description
REQ	NEW CHG	Add, or Change.
TYPE	TSP	Terminal Service Profile.
DSL	l s c dsl c dsl	Digital Subscriber Loop address. For Option 11C.
USID	x	User Service Identifier.
...		
DN	xxx...x	Directory Number associated with TSP (1 to 7 digits).
...		

- CLIP	YES	Calling Line Identification Presentation for Incoming Calls Allowed. NO = Denied.
- PRES	YES	Presentation of Name and Calling Line Identification (CLID) to far end on outgoing calls allowed. NO = Denied.

LD 16 – QSIG BRI route configuration.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	RDB	Route Data Block.
CUST	xx	Customer number.
...		
DTRK	xxxx	Digital Trunk Type for route.
- IFC	xxxx	Interface type for PRI route where xxxx is: ESGF = Interface ID for ETSI QSIG with GF capability. ISGF = Interface ID for ISO QSIG with GF capability.
- RCAP	NDS	Allow Name Display Services (NDS) as new remote capability.

LD 16 – Configure Remote Capability for an MCDN BRI route.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	RDB	Route Data Block.
CUST	xx	Customer number.
...		
DTRK	xxxx	Digital Trunk Type for route.

- IFC	xxxx	Interface type for D-channel where xxxx is: ESGF = Interface ID for ETSI QSIG with GF capability. ISGF = Interface ID for ISO with GF capability.
- RCAP	ND3	Allow Name Display 3 (ND3) remote capability.
- NCNA	YES	Network Calling Name Allowed.

LD 17 – Configure Remote Capability for QSIG D-channel.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	ADAN	Action Device and Number.
- ADAN	aaa dch x	Change or New D-channel where aaa = NEW or CHG.
...		
- IFC	SL1	Interface type for D-channel.
...		
- RCAP	NDS	Allow Name Display Services (NDS) as new remote capability.

LD 17 – Configure Remote Capability for MCDN D-channel.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	ADAN	Action Device and Number.
- ADAN	aaa dch x	Change Input/Output Device.
...		
- IFC	SL1	Interface type for D-channel.

...		
- RCAP	ND3	Allow Name Display 3 (ND3) as new remote capability.

LD 57 – Define the Calling Party Privacy Flexible Feature Code for Meridian 1 proprietary and Analog (500/2500 type) sets.

Prompt	Response	Description
REQ	NEW CHG	Add, or Change.
TYPE	FFC	Flexible Feature Code data block.
CUST	xx	Customer number.
FFCT	YES	Flexible Feature Confirmation Tone.
...		
CPP	xxxx	Calling Party Privacy Flexible Feature Code (typically *67). CPP is only prompted if the CPP package is equipped.

Feature operation

To activate Calling/Connected Name Identification Restriction (CNIR) on a per call basis, the calling party dials the Calling Party Privacy (CPP) Flexible Feature Code prior to initiating the call.

ISDN QSIG Name Display Enhancement

Contents

The following are the topics in this section:

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Operating parameters 1085
Feature interactions 1086
Feature packaging 1102
Feature implementation 1103
Task summary list 1103
ISDN PRI implementation 1105
ISDN BRI implementation 1110
Feature operation 1112

Regional material statement

ISDN BRI trunking is not available in North America. Contact your system supplier or your Nortel Networks representative to verify support of this product in your area.

Feature Description

The ISDN QSIG Supplementary Service - Name Display feature, supports the following Name Display supplementary services across an ISDN QSIG network:

- **Calling Name Identification Presentation (CNIP)**. This service is offered to the called party, to provide the name of the calling party. Once configured, CNIP is permanently activated.

  CNIP is based on the Class of Service of the originating set, as configured in LD 10 or LD 11. If the CLS prompt is configured as Name Presentation Allowed (NAMA), the name of the calling party is displayed on the set of the terminating party. If the CLS prompt is set to Name Presentation Denied (NAMD), or if the calling party name is not available (due, for example, to the name not being registered, or because of call interworking), then CNIP is not able to provide the caller's name to the called party.

  Note: To restrict the presentation of a calling party on ISDN BRI sets, the Presentation (PRES) prompt in LD 27 is set to NO. This applies for the other Name Display supplementary services as well.

- **Connected Name Identification Presentation (CONP)**. This service applies to an established call. It is offered to the calling party, providing alerting information, or the called or connected party name. Once configured, CONP is permanently activated.

  CNOP is based on the Class of Service of the terminating set, as configured in LD 10 or LD 11. If the CLS prompt is configured as Name Presentation Allowed (NAMA), the name of the called party is displayed on the set of the calling party. If the CLS prompt is set to Name Presentation Denied (NAMD), or if the called party name is not available (due, for example, to the name not being registered, or because of call interworking), then the called party name is not provided to the calling party.

- **Calling/Connected Name Identification Restriction (CNIR)**. This service prevents the name display of a calling party from being presented to the called party.

  CNIR may be activated for all calls by setting the CLS prompt in LD 10 or LD 11 to Name Presentation Denied (NAMD). If the CLS has been set to Name Presentation Allowed (NAMA), CNIR may be activated on a per-call basis, by dialing the Calling Party Privacy Flexible Code before making a call.

  Note: The capability of activating CNIR on ISDN BRI sets is not supported.

These Name Display supplementary services are provided across an ISDN QSIG network using the QSIG Generic Functional (GF) protocol transport platform.

The QSIG Supplementary Service - Name Display Enhancement feature, provides the option of choosing the method of Operation Coding for the Name Display supplementary services described above. The choice may be by Object Identifier, used for European Telecommunications Standard Institute (ETSI) interfaces, or by Integer Value, used for International Standards Organization (ISO) interfaces. The Operation Coding method is configured as a remote capability using the RCAP prompt for an ISDN PRI D-Channel for ISDN PRI, or for an ISDN BRI route for ISDN BRI trunking.

Operating parameters

QSIG allows a maximum of 50 characters to be displayed for Name Display information. However, up to only 27 characters are allowed with the Calling Party Name Display feature. Consequently, if the name display string exceeds 27 characters, it will be truncated.

The QSIG Supplementary Service - Name Display Enhancement feature may interwork with the MCDN Name Display feature, depending on the Network Name Display (ND) method (either ND1, ND2, or ND3) configured as the Remote Capability (using RCAP prompt in LD 17) for the associated D-Channel. ND3 ensured the same level of service between the MCDN Name Display and QSIG Name Display supplementary services.

The user-based service profile cannot be used to override the Calling Name Identification Restriction service.

For Calling/Connected Name Identification Restriction (CNIR), restricting the presentation of name information is supported only for a calling party.

Busy name information sent with a DISCONNECT message is only supported for Overlap Receiving (the OVLR prompt is set to YES in LD 17).

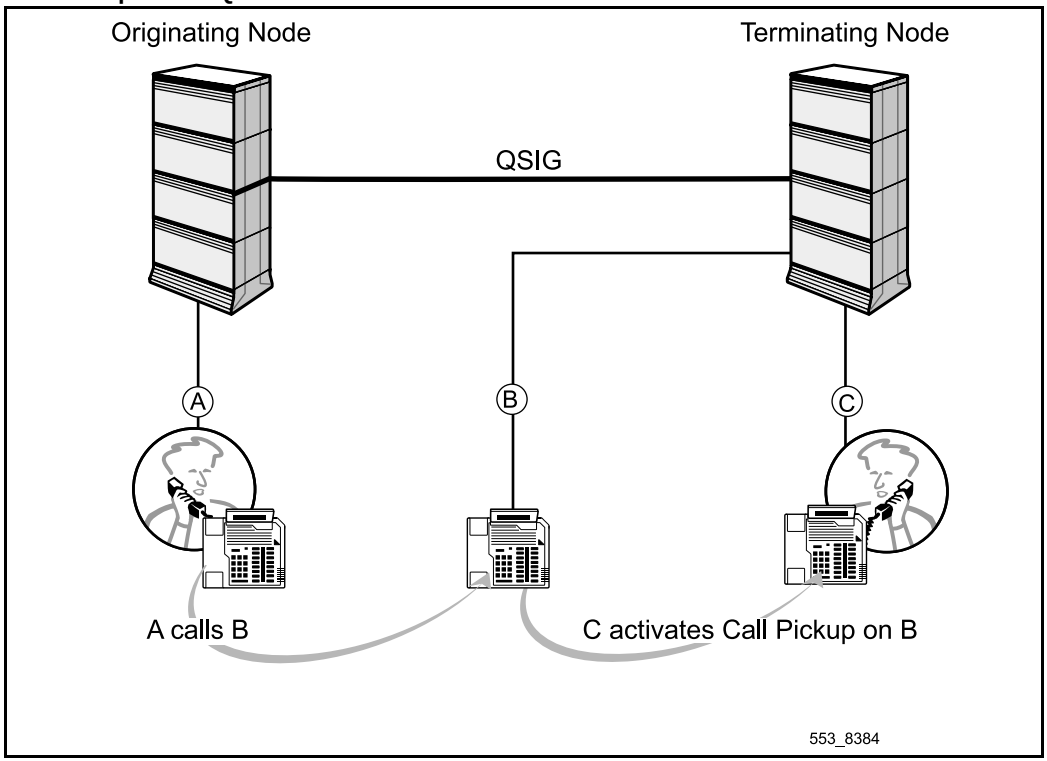
Feature interactions

Call Pickup (over a QSIG link)

Referring to Figure 77, Station A, at the originating node, calls Station B, at the terminating node, over a QSIG link. Station C, also at the terminating node, picks up the call.

If Station A has a Class of Service of Name Presentation Allowed (CLS = NAMA in LD 10 or LD 11), then Station A's name information will be presented to Station C. If Station A has a Class of Service of Name Presentation Denied (CLS = NAMD in LD 10 or LD 11), then Station A's name information will not be presented to Station C. Station A's display will be updated with the connected party (Station C) information, once the call pickup has been established. The reason for the call modification (Pickup) will not be presented to Station A.

Figure 77
Call Pickup over a QSIG link



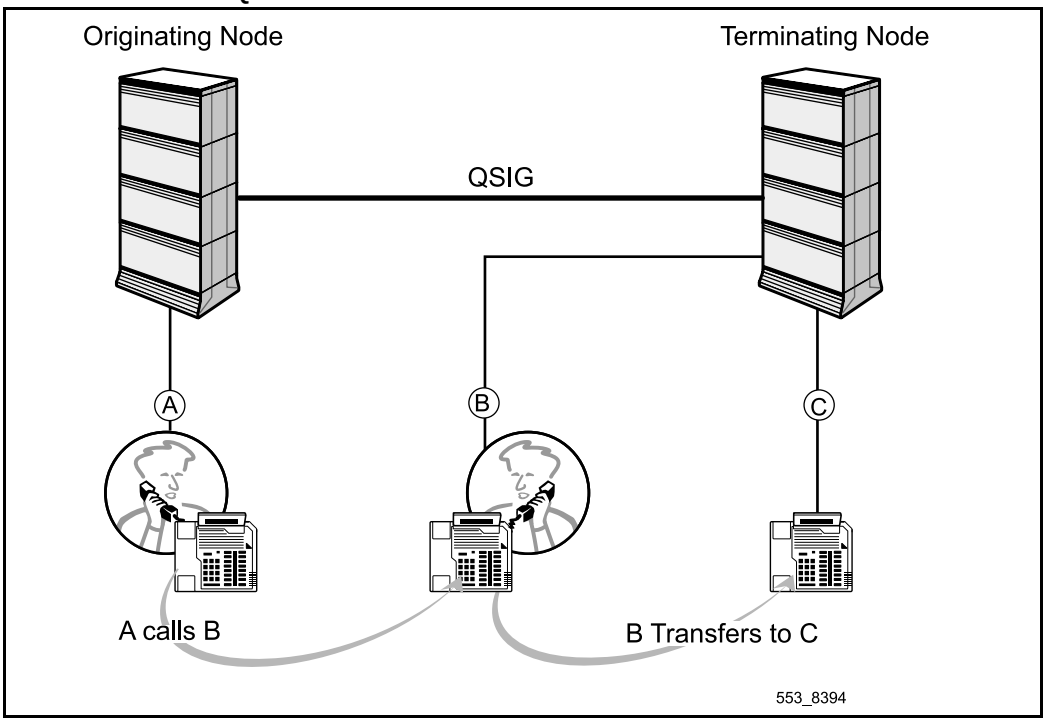
Call Transfer (over a QSIG link)

Referring to Figure 78, Station A, at the originating node, calls Station B, at the terminating node, over a QSIG link. Station B transfers the call to Station C, also at the terminating node.

If Station A has a Class of Service of Name Presentation Allowed (CLS = NAMA in LD 10 or LD 11), then Station A's name information will be presented to Station C, after the transfer has been completed.

If Station A has a Class of Service of Name Presentation Denied (CLS = NAMD in LD 10 or LD 11), then Station A's name information will not be presented to Station C, after the transfer has been completed. Station A's display will not be updated with the connected party (Station C) information, once the call transfer has been completed. The reason for the call modification (Transfer) will not be presented to Station A.

Figure 78
Call Transfer over a QSIG link

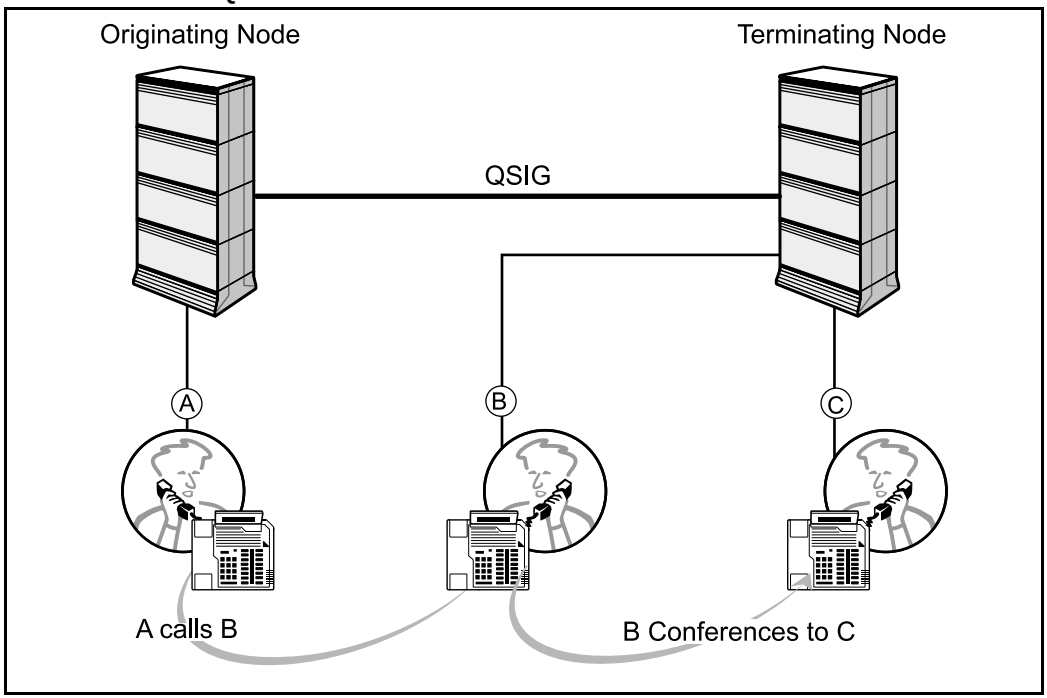


Conference (over a QSIG link)

Referring to Figure 79, Station A, at the originating node, calls Station B, at the terminating node, over a QSIG link. Station B conferences the call to Station C, also at the terminating node.

If Station A has a Class of Service of Name Presentation Allowed (CLS = NAMA in LD 10 or LD 11), then Station A's name information will be presented to Station C, after Station B drops out of the conference.
If Station A has a Class of Service of Name Presentation Denied (CLS = NAMD in LD 10 or LD 11), then Station A's name information will not be presented to Station C, after Station B drops out of the conference. Station A's display will be updated with Station B's name received in alert and connect messages.

Figure 79
Conference over a QSIG link



Call Forward all types (over a QSIG link)

Call Forward all types comprises the following call modifications:

- Call Forward All Calls (CFW)
- Call Forward Busy (CFB)
- Call Forward by Call Type (CFT)

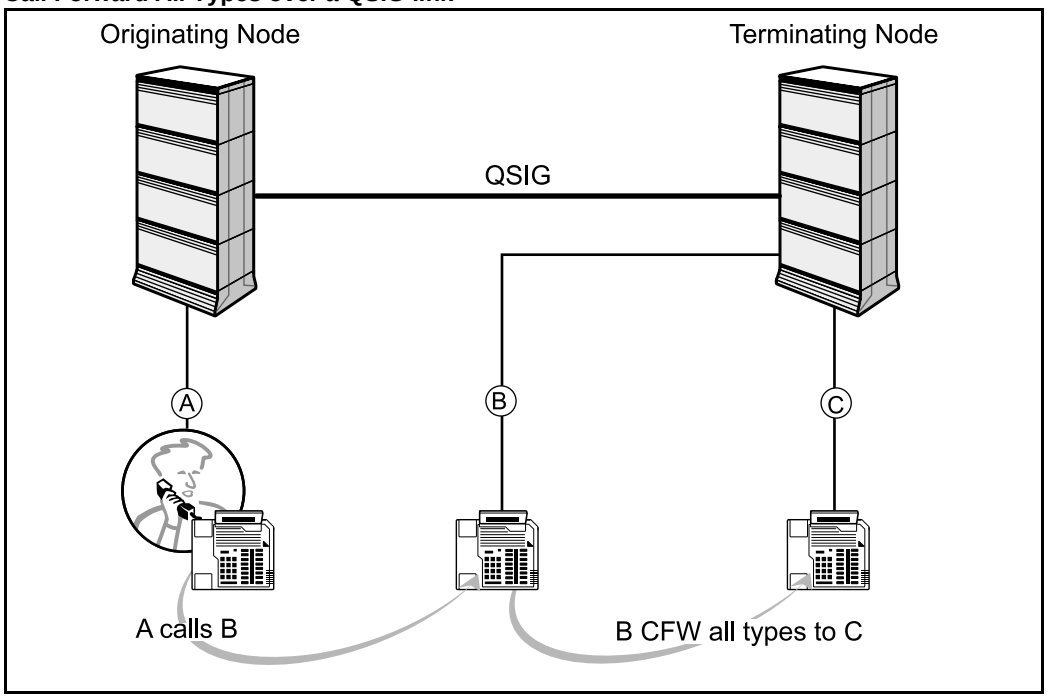
- Call Forward External Deny (CFX)
- Call Forward, Internal Calls
- Call Forward No Answer/Flexible Call Forward No Answer (CFNA)
- Call Forward No Answer, Second Level

Referring to Figure 80, Station A, at the originating node, calls Station B, at the terminating node, over a QSIG link. Station B forwards the call to Station C, also at the terminating node.

If Station A has a Class of Service of Name Presentation Allowed (CLS = NAMA in LD 10 or LD 11), then Station A's name information will be presented to Station C, after Station B completes the call forward. If Station A has a Class of Service of Name Presentation Denied (CLS = NAMD in LD 10 or LD 11), then Station A's name information will not be presented to Station C, after Station B completes the call forward.

In the case where Station B's set rings before Station C's set (during Call Forward No Answer), then Station A's display will be updated with Station C's name information, once Station C's set rings. In the case where Station C's set rings directly (during Call Forward All Calls), then Station A's display will be updated directly with Station C's name information. The reason for the call forward (type of call forward) will not be presented to Station A.

Figure 80
Call Forward All Types over a QSIG link



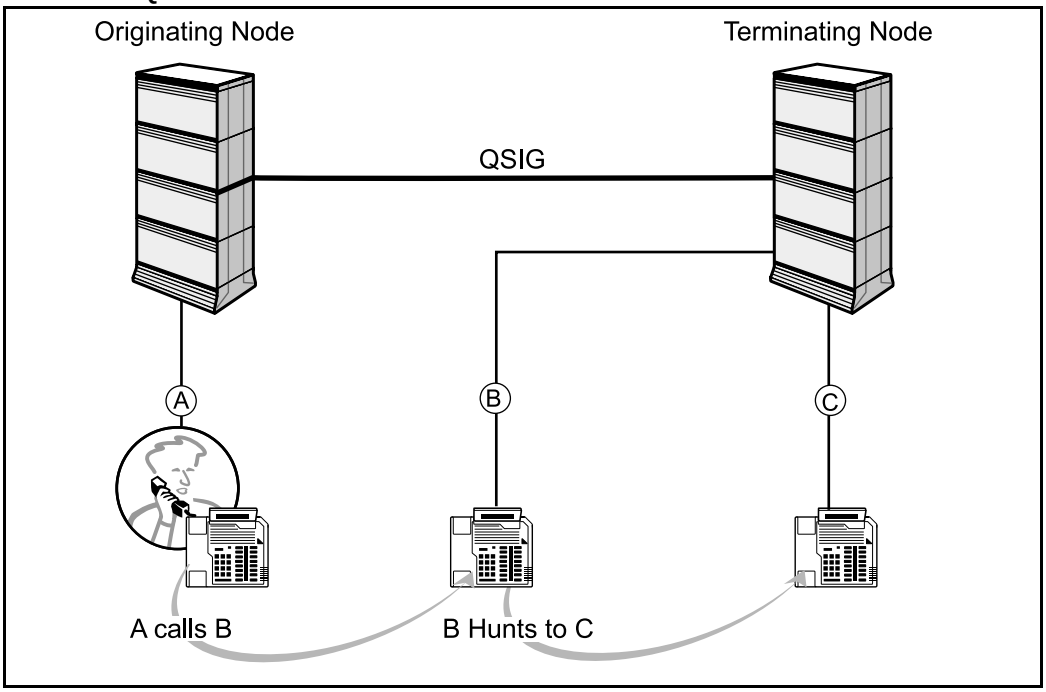
Hunt (over a QSIG link)

Referring to Figure 81, Station A, at the originating node, calls Station B, at the terminating node, over a QSIG link. The call is hunted from Station B to Station C, also at the terminating node.

If Station A has a Class of Service of Name Presentation Allowed (CLS = NAMA in LD 10 or LD 11), then Station A's name information will be presented to Station C, after the call hunt has been completed to Station C (Station C's set is ringing). If Station A has a Class of Service of Name Presentation Denied (CLS = NAMD in LD 10 or LD 11), then Station A's name information will not be presented to Station C, after the call hunt has been completed to Station C (Station C's set is ringing).

Station A's display will be updated with the Station C's name information, while Station C's set is ringing. The reason for the call modification (Hunt) will not be presented to Station A.

Figure 81
Hunt over a QSIG link

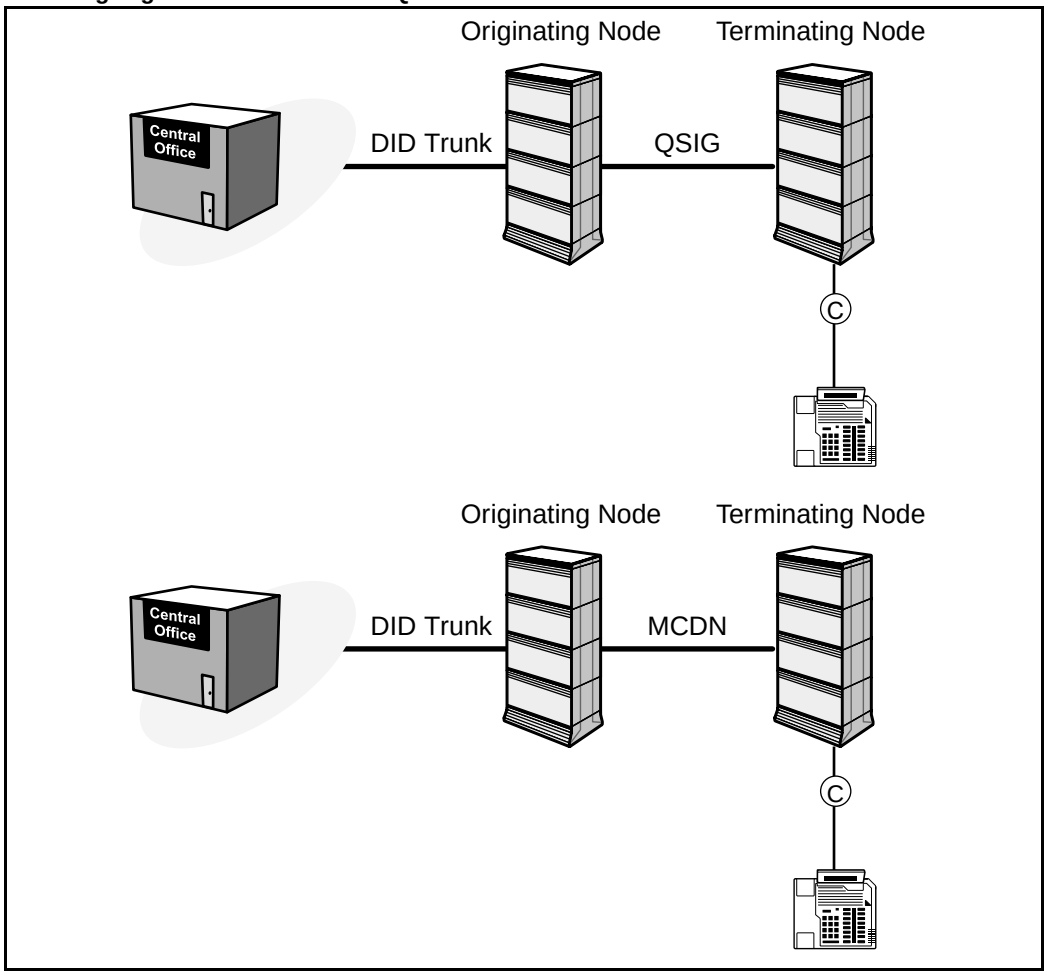


Incoming Digit Conversion (over a QSIG link)

Referring to Figure 82, a Central Office DID call comes over a Direct Inward Dial (DID) trunk to an originating node, and terminates on Station C at a terminating node, over a QSIG link.

If no name information is received from the DID trunk, and Incoming Digit Conversion (IDC) is activated and the incoming name information is associated to the new digit sequence, then this name information is passed to Station C at the terminating node. If name information is received from the DID trunk, this takes precedence over the IDC trunk name.

Figure 82
Incoming Digit Conversion over a QSIG link



Call Forward All Types (QSIG/MCDN link)

Call Forward all types comprises the following call modifications:

- Call Forward All Calls (CFW)
- Call Forward Busy (CFB)
- Call Forward by Call Type (CFT)

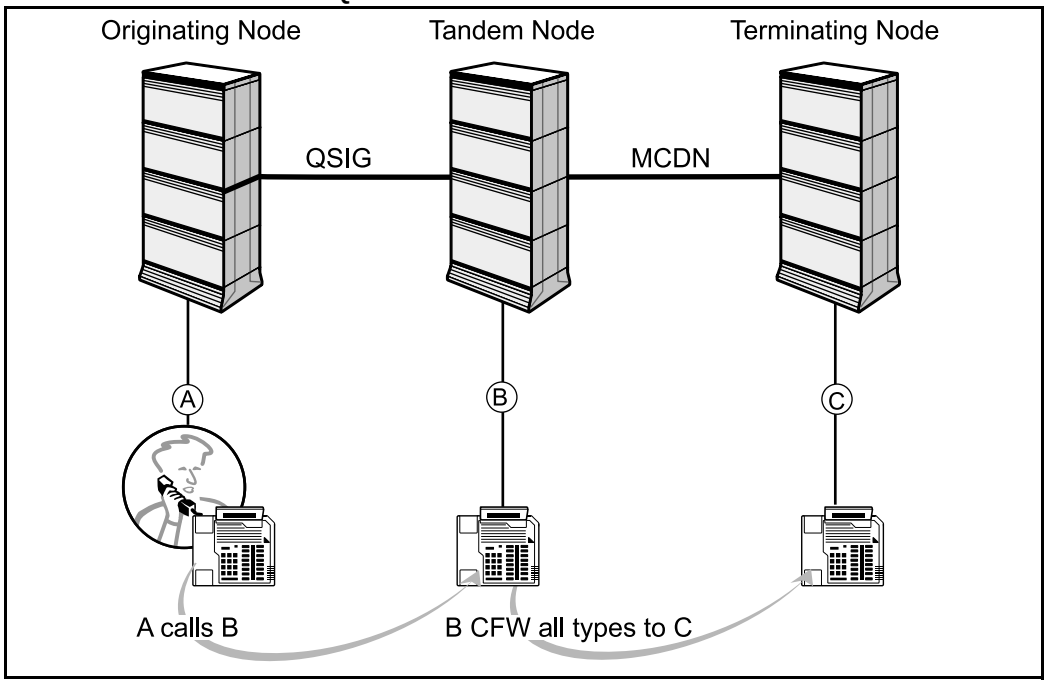
- Call Forward External Deny (CFX)
- Call Forward, Internal Calls
- Call Forward No Answer/Flexible Call Forward No Answer (CFNA)
- Call Forward No Answer, Second Level

Referring to Figure 83, Station A, at the originating node, calls Station B, at a tandem node, over a QSIG link. Station B forwards the call to Station C, at the terminating node, over an MCDN link.

If Station A has a Class of Service of Name Presentation Allowed (CLS = NAMA in LD 10 or LD 11), then Station A's name information will be presented to Station C, after Station B completes the call forward. If Station A has a Class of Service of Name Presentation Denied (CLS = NAMD in LD 10 or LD 11), then Station A's name information will not be presented to Station C, after Station B completes the call forward.

In the case where Station B's set rings before Station C's set (as in the case of Call Forward No Answer), then Station A's display will be updated with Station C's name information, once Station C's set rings. In the case where Station C's set rings directly (as in the case of Call Forward All Calls), then Station A's display will be updated directly with Station C's name information. The reason for the call forward (type of call forward) will not be presented to Station A.

Figure 83
Call Forward All Calls over a QSIG/MCDN link



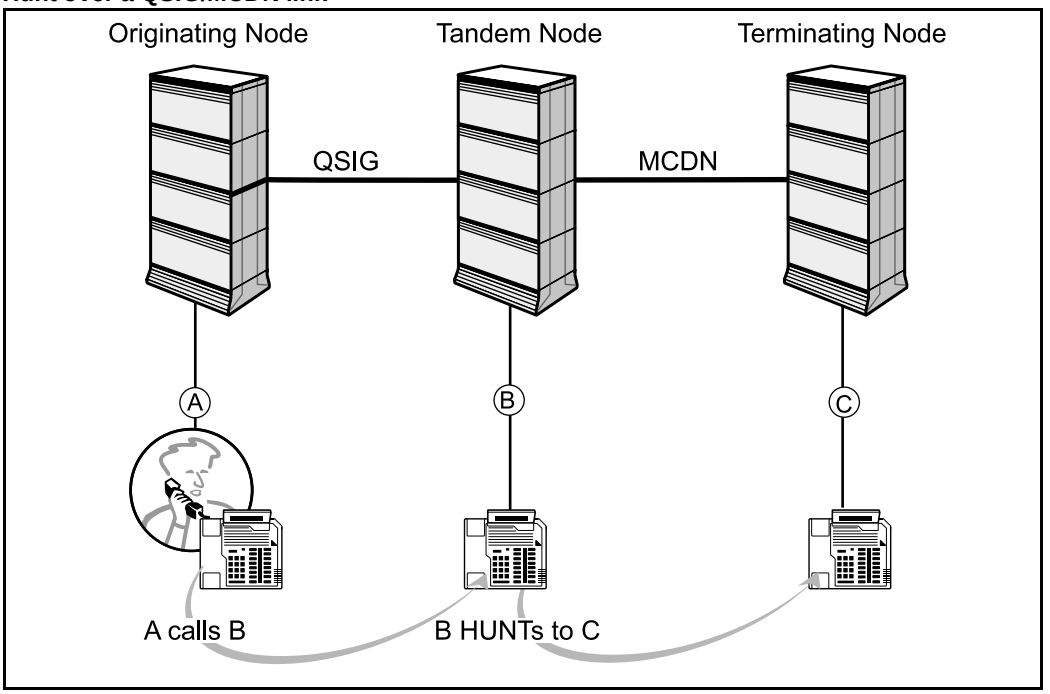
Hunt (QSIG/MCDN link)

Referring to Figure 84, Station A, at the originating node, calls Station B, at the terminating node, over a QSIG link. The call is hunted over an MCDN link from Station B to Station C, at the terminating node.

If Station A has a Class of Service of Name Presentation Allowed (CLS = NAMA in LD 10 or LD 11), then Station A's name information will be presented to Station C, after the call hunt has been completed to Station C (Station C's set is ringing).

If Station A has a Class of Service of Name Presentation Denied (CLS = NAMD in LD 10 or LD 11), then Station A's name information will not be presented to Station C, after the call hunt has been completed to Station C (Station C's set is ringing). Station A's display will be updated with the Station C's name information, while Station C's set is ringing. The reason for the call modification (Hunt) will not be presented to Station A.

Figure 84
Hunt over a QSIG/MCDN link

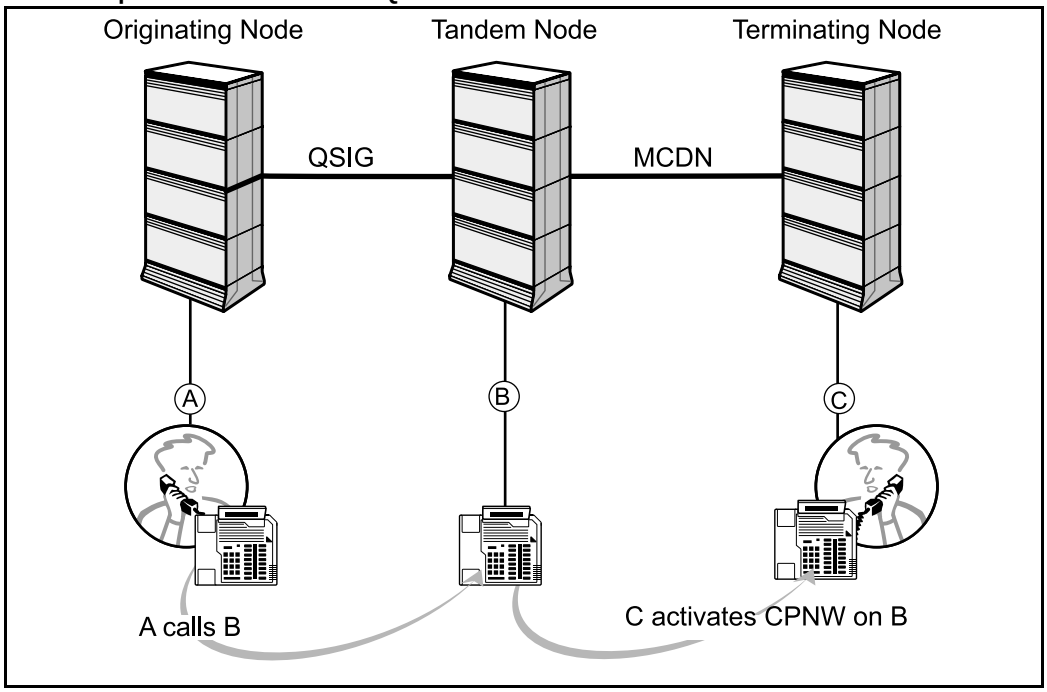


Call Pickup Network Wide (QSIG/MCDN link)

Referring to Figure 85, Station A, at the originating node, calls Station B, at the terminating node, over a QSIG link. Station C, at the terminating node, picks up the call over an MCDN link.

If Station A has a Class of Service of Name Presentation Allowed (CLS = NAMA in LD 10 or LD 11), then Station A's name information will be presented to Station C. If Station A has a Class of Service of Name Presentation Denied (CLS = NAMD in LD 10 or LD 11), then Station A's name information will not be presented to Station C. Station A's display will be updated with the connected party (Station B) information, once the call pickup has been established. The reason for the call modification (Pickup) will not be presented to Station A.

Figure 85
Call Pickup Network Wide over a QSIG/MCDN link



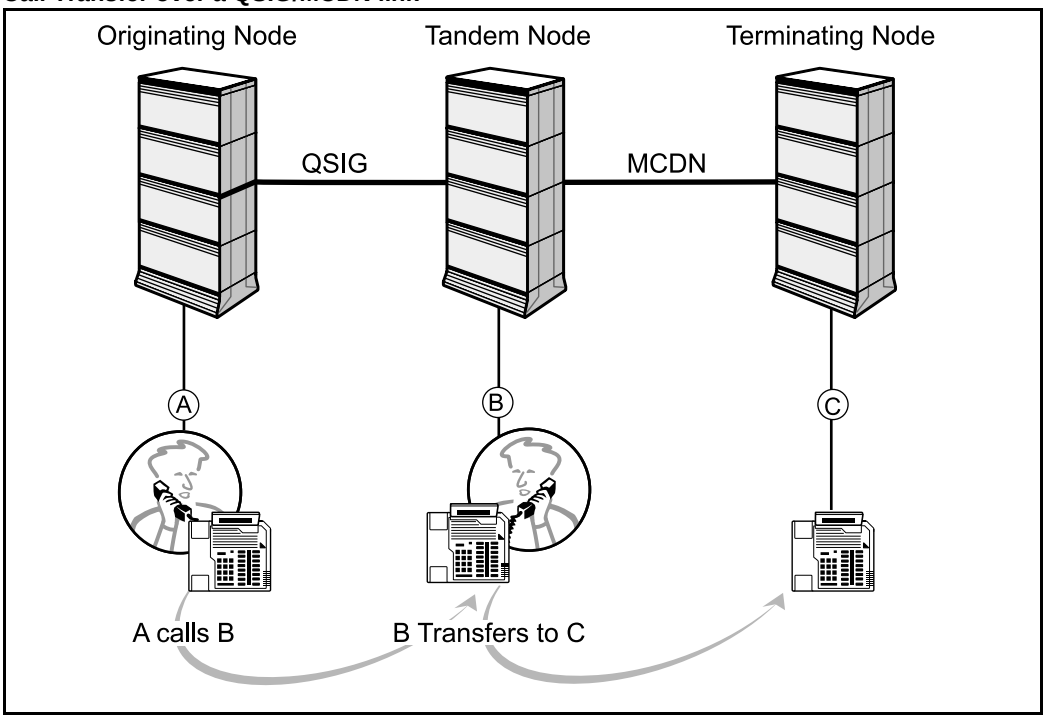
Call Transfer (QSIG/MCDN link)

Referring to Figure 86, Station A, at the originating node, calls Station B, at the terminating node, over a QSIG link. Station B transfers the call to Station C, at the terminating node, over an MCDN link.

If Station A has a Class of Service of Name Presentation Allowed (CLS = NAMA in LD 10 or LD 11), then Station A's name information will be presented to Station C, after the transfer has been completed.

If Station A has a Class of Service of Name Presentation Denied (CLS = NAMD in LD 10 or LD 11), then Station A's name information will not be presented to Station C, after the transfer has been completed. Station A's display will not be updated with the connected party (Station C) information, once the call transfer has been completed. The reason for the call modification (Transfer) will not be presented to Station A.

Figure 86
Call Transfer over a QSIG/MCDN link

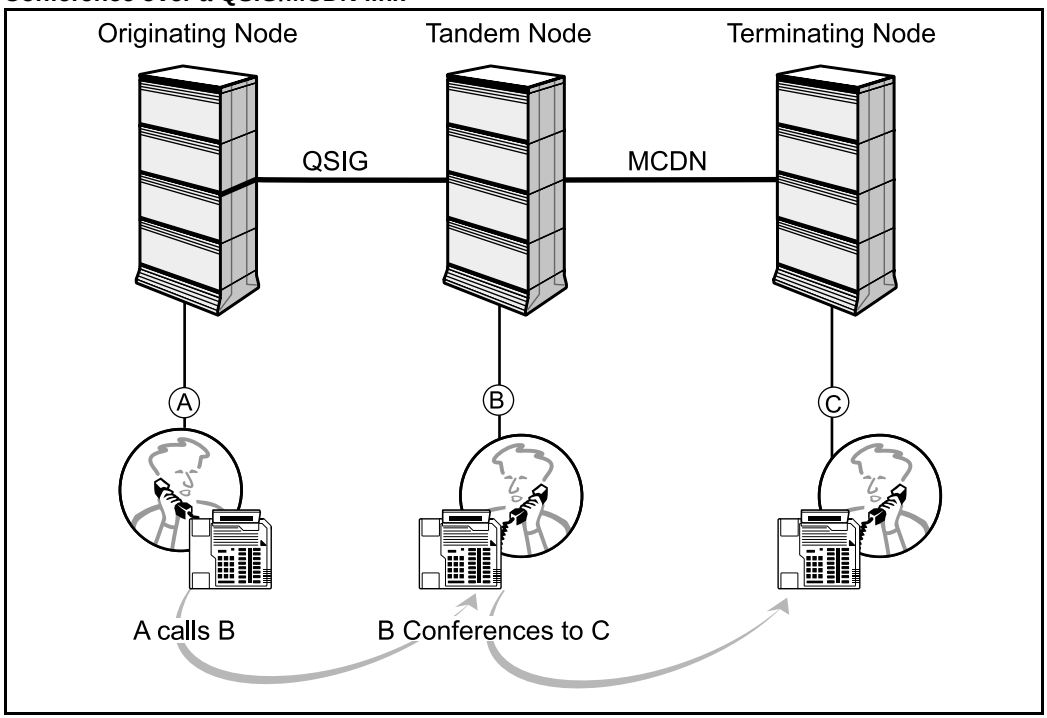


Conference (QSIG/MCDN link)

Referring to Figure 87, Station A, at the originating node, calls Station B, at the terminating node, over a QSIG link. Station B conferences the call to Station C, at the terminating node, over an MCDN link.

If Station A has a Class of Service of Name Presentation Allowed (CLS = NAMA in LD 10 or LD 11), then Station A's name information will be presented to Station C, after Station B drops out of the conference.
If Station A has a Class of Service of Name Presentation Denied (CLS = NAMD in LD 10 or LD 11), then Station A's name information will not be presented to Station C, after Station B drops out of the conference. Station A's display will be updated with Station B's name received in alert and connect messages.

Figure 87
Conference over a QSIG/MCDN link

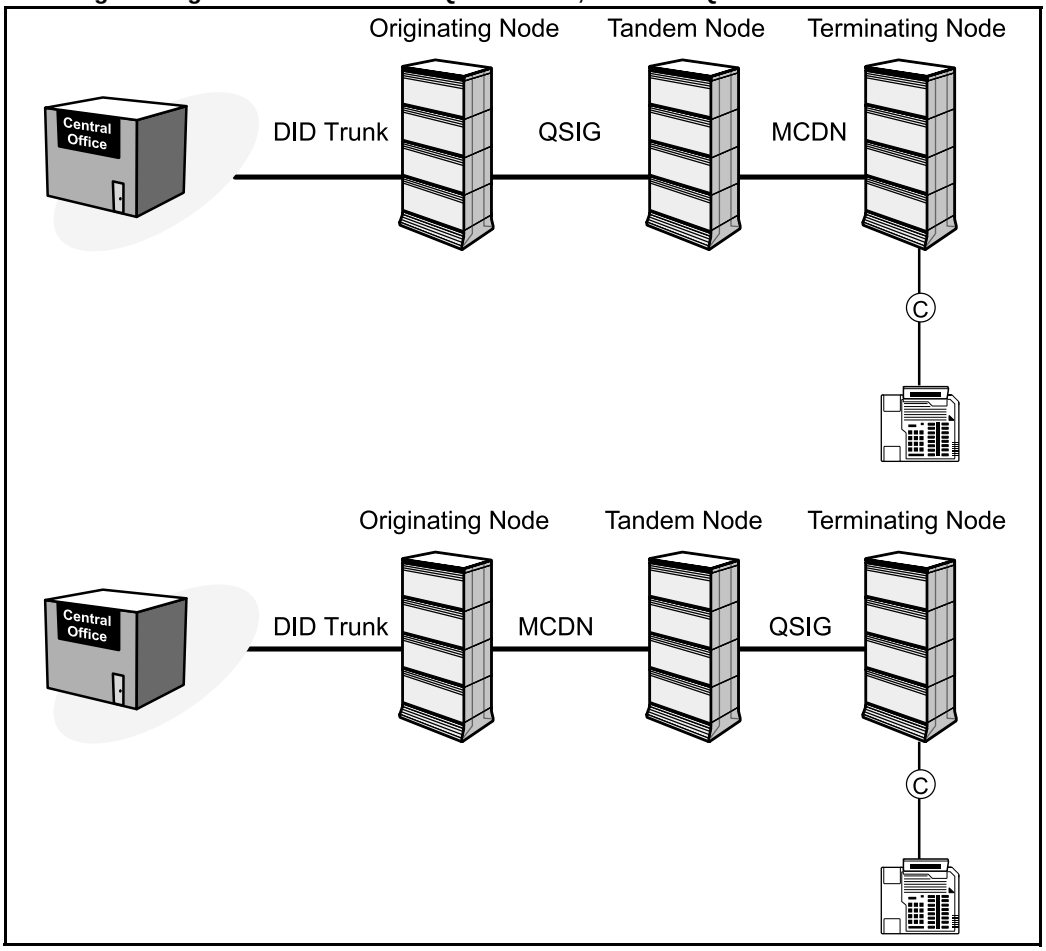


Incoming Digit Conversion (QSIG/MCDN or MCDN/QSIG link)

Referring to Figure 88, A Central Office DID call comes over a Direct Inward Dial (DID) trunk to an originating node. The call is routed to a tandem node over a QSIG link. From the tandem node, it is routed to Station C at a terminating node, over an MCDN link. Or, a Central Office DID call comes over a Direct Inward Dial (DID) trunk to an originating node. The call is routed to a tandem node over an MCDN link. From the tandem node, it is routed to Station C at a terminating node, over a QSIG link.

If no name information is received from the DID trunk, and Incoming Digit Conversion (IDC) is activated and the incoming name information is associated to the new digit sequence, then this name information is passed to Station C at the terminating node. If name information is received from the DID trunk, this takes precedence over the IDC trunk name.

Figure 88
Incoming DID Digit Conversion over a QSIG/MCDN, or MCDN/QSIG link

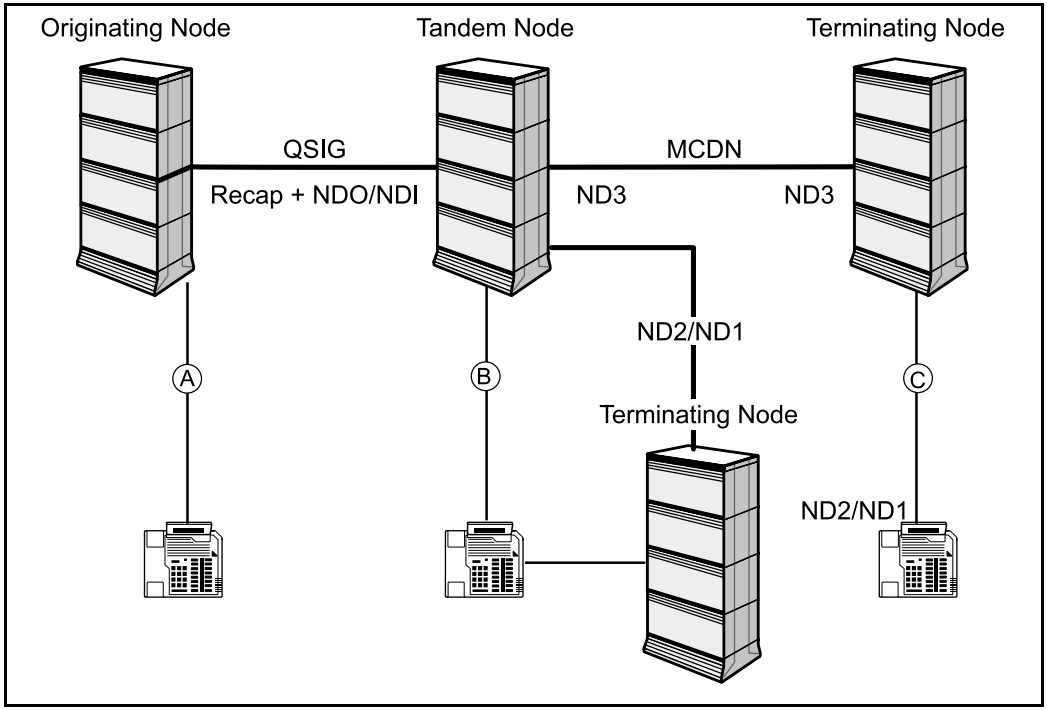


MCDN Name Display features (QSIG/MCDN link)

When a QSIG network interworks with an MCDN network, consistent interworking of the QSIG Supplementary Service - Name Display Enhancement feature and the MCDN Name Display features depends on how the Remote Capability (RCAP) has been configured for the MCDN Name Display feature.

For MCDN, the RCAP prompt is used to configure the Network Name Display (ND) method (either ND1, ND2, or ND3) for the associated D-Channel. ND3 ensures the same level of service between the MCDN Name Display and QSIG Name Display supplementary services. Refer to Figure 89.

Figure 89
MCDN Name Display features over a QSIG/MCDN link



QSIG Call Diversion Notification

Calling Name

A QGIG Call Diversion occurs to a station. After the Diversion Notification Information is received at the diverted-to node, the station's display will be updated with the calling name information, if it has a Class of Service of Dialed Name Display Denied (CLS = DNDD in LD 10 or LD 11). If the set has a Class of Service of Dialed Name Display Allowed (CLS = DNDA in LD 10 or LD 11), then another name, or none, is displayed on the set.

Alerting and Connected Name

When the names from both a QSIG Name Display Service and a QSIG Call Diversion are included in the same message, the name from the QSIG Name Display Service will be ignored (the QSIG Name Display and the QSIG Call Diversion names should be the same).

QSIG Path Replacement

For QSIG Path Replacement, the name conveyed in any message of a new call is not displayed on any set.

QSIG Call Transfer

Calling, Alerting, and Connected Name

For QSIG Call Transfer, the Calling, Alerting, and Connected Name are not provided at the transferring Private Integrated Services Network Exchange (PINX).

Connected Name

If connected name information is received, either as part of a QSIG Name Display Service or QSIG Call Transfer Notification, it will be displayed, unless there are subsequent presentation restriction options that may prevent it from being displayed.

Feature packaging

The following packages are required for the QSIG Supplementary Service - Name Display Enhancement feature:

- Q-reference Signaling Point Interface (QSIG) package 263
- QSIG Generic Functional Protocol Transport (QSIG-GF) package 305
- QSIG Supplementary Services (QSIG-SS) package 316
- Integrated Services Digital Network (ISDN) package 145
- Multi-purpose Serial Data Link (MSDL) package 222
- International Primary Rate Access (IPRA) package 202
- Primary Rate Access (PRI) package 146
- 2.0 Mb Primary Rate Access (PRI2) package 154

For the QSIG Name Display service, the following packages are required:

- Digit Display (DDSP) 19
- Call Party Name Display (CPND) package 95
- International Supplementary Features (SUPP) package 131, to allow the Digit and Name Party restriction capability (without package 131, Digit and Name presentation will always be allowed)
- Calling Party Privacy (CPP) package 301
- Flexible Feature Code (FFC) package 139

For ISDN Basic Rate Interface Trunking (BRIT), the following additional packages are required:

- ISDN Basic rate Access (BRI) 216
- ISDN Basic Rate Trunk Access (BRIT) package 233

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 95 – Configure Calling Party Name Display data block for a customer.

2 LD 95 – Define a name string for a customer.

3 LD 10 - Define the Calling Name Class of Service for analog (500/2500) sets.

4 LD 11 - Define the Calling Name Class of Service for Meridian 1 proprietary sets.

5 LD 12 – Define the Calling Name Class of Service for attendant consoles.

6 LD 17 – Configure the method of Operation Coding for the Name Display supplementary services, for the associated QSIG D-Channel. The value is configured as a remote capability. It may be either by Object Identifier, used for ETSI, or by Integer Value, used for ISO.

7 LD 57 – Configure the Flexible Feature Code for Calling Private Privacy.

8 LD 16 - Configure the method of Operation Coding for the Name Display supplementary services, for the associated QSIG ISDN BRI trunk route.

9 LD 27 - Configure the Calling Line Presentation (CLIP) service, and Calling Line Identification presentation option in the Terminal Service Profile, for an ISDN BRI QSIG Digital Subscriber Loop (DSL).

This section contains the procedures required to configure the QSIG Supplementary Services - Name Display Enhancement feature on a Meridian 1 PBX.

For ISDN PRI:

- Configure Calling Party Name Display data block for a customer, using LD 95.
- Define a name string for a customer, using LD 95.
- Define the Calling Name Class of Service for analog (500/2500) sets, using LD 10.
- Define the Calling Name Class of Service for Meridian 1 proprietary sets, using LD 11.
- Define the Calling Name Class of Service for attendant consoles, using LD 12.
- Configure the method of Operation Coding for the Name Display supplementary services, for the associated D-Channel, using LD 17. The value is configured as a Remote Capability. It may be either by Object Identifier, used for ETSI, or by Integer Value, used for ISO.
- Configure the Flexible Feature Code for Calling Private Privacy, using LD 57.

For ISDN BRIT:

- Configure the method of Operation Coding for the Name Display supplementary services, for the associated QSIG ISDN BRI trunk route, using LD 16.
- Configure the Calling Line Presentation (CLIP) service, and Calling Line Identification presentation option, in the Terminal Service Profile (TSP) for an ISDN BRI QSIG Digital Subscriber Loop (DSL), using LD 27.

ISDN PRI implementation

LD 95 – Configure Calling Party Name Display data block for a customer.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	CPND	Configure the Calling Party Name Display data block.
CUST	xx	Customer number, as defined in LD 15. xx = 0-99 for Options 51C-81C. xx = 0-31 for Option 11C.
...		

LD 95 – Define a name string for a customer.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	NAME	Create a new Calling Party Name string.
CUST	xx	Customer number, as previously entered in LD 95 when configuring the CPND data block. xx = 0-99 for Options 51C-81C. xx = 0-31 for Option 11C.
...		

DN ...	xxx...x	Directory Number (1 to 7 digits) to which the name string is associated.

LD 10 - Define the Calling Name Class of Service for analog (500/2500) sets.

Prompt	Response	Description
REQ:	NEW CHG	Add new data. Change existing data.
TYPE:	500	Type of analog set.
TN	l s c u	Terminal Number, for Options 51C-81C. l = loop, s = shelf, c = card, u = unit.
	c u	Terminal Number for Option 11C. c = card, u = unit.
...		
DES	d...d	Designator The response d...d represents an Office Data Administration System (ODAS) Station Designator of 1-6 alphanumeric characters.
CUST	xx	Customer number, as previously entered in LD 95. xx = 0-99 for Options 51C-81C. xx = 0-31 for Option 11C.
...		
DN	x..x	Directory Number.
- CPND	 NEW CHG OUT	Calling Party Name Display Add data block. Change existing data block. Remove existing data block.
- NAME	 aaaa yyyy	Calling Party Name Display name. aaaa = first name, yyyy = last name.

- XPLN	xx	Expected name length.
...		
CLS	NAMA	Allow calling name display at the far end. (NAMD) = Name Display Denied is the default.
...		

LD 11 - Define the Calling Name Class of Service for Meridian 1 proprietary sets.

Prompt	**Response**	**Description**
REQ:	NEW CHG	Add new data. Change existing data.
TYPE:	aaaa	Type of set.
TN	l s c u	Terminal Number, for Options 51C-81C. l = loop, s = shelf, c = card, u = unit.
	c u	Terminal Number for Option 11C. c = card, u = unit.
...		
DES	d...d	Designator The response d...d represents an Office Data Administration System (ODAS) Station Designator of 1-6 alphanumeric characters.
CUST	xx	Customer number, as previously entered in LD 95 when configuring the CPND data block. xx = 0-99 for Options 51C-81C xx = 0-31 for Option 11C.
...		

CLS		Enter each non-default Class of Service entry separated by a space.
	CNDA	Allow the calling name to be displayed on this set. (CNDD) = Deny calling name display is default.
	DNDA	Allow the name of the original caller to be displayed on this set, for redirected calls. (DNDD) = Dialed Name Display Denied is default.
	NAMA	Allow calling name display at the far end. (NAMD) = Name Display on other set Denied is default.
KEY	xx aaa yyyy	Telephone function key and assignments.
- CPND		Calling Party Name Display
	NEW	Add data block.
	CHG	Change existing data block.
	OUT	Remove existing data block.
- NAME		Calling Party Name Display name.
	aaaa yyyy	aaaa = first name, yyyy = last name.
...		

LD 12 – Define the Calling Name Class of Service for attendant consoles.

Prompt	Response	Description
REQ:	NEW	Add new data
	CHG	Change existing data.
TYPE:	aaaa	Type of attendant console.
TN	l s c u	Terminal Number, for Options 51C-81C. l = loop, s = shelf, c = card, u = unit.
	c u	Terminal Number for Option 11C. c = card, u = unit.
SETN	l s c u	Second Terminal Number. Must have same loop, shelf and card as Terminal Number. l = loop, s = shelf, c = card, u = unit for Option 51-81C.
	c u	c = card, u = unit for Option 11C.

CUST ...	xx	Customer number, as previously entered in LD 95 when configuring the CPND data block. xx = 0-99 for Options 51C-81C. xx = 0-31 for Option 11C.
ANUM ...	1-63	Attendant Number.
CPND ...	CNDA	Allow the calling name to displayed on this console. (CNDD) = Call Party Name Display feature Denied is the default.

LD 17 – Configure the method of Operation Coding for the Name Display supplementary services, for the associated QSIG D-Channel. The value is configured as a remote capability. It may be either by Object Identifier, used for ETSI, or by Integer Value, used for ISO.

Prompt	**Response**	**Description**
REQ	CHG	Change existing data.
TYPE	ADAN	Action Device and Number.
- ADAN	CHG DCH xx	Change a D-Channel on port 0-63 (Options 51C-81C).
	CHG DCH xx	Change a D-Channel on port 0-15 (Option 11C).
...		
- IFC	ESGF ISGF	ESGF = ETSI QSIG interface with GF platform. ISGF = ISO QSIG interface with GF platform.
...		

- RCAP		Enter the Operation Coding method for the QSIG Name Display supplementary services.
	NDO NDI	NDO = Coding by Object ID (IFC should be set to ESGF). NDI = Coding by Integer Value (IFC should be set to ISGF). Precede the entry with an 'X' to delete it. ***Note:*** NDO and NDI are mutually exclusive.
...		

LD 57 – Configure the Flexible Feature Code for Calling Private Privacy.

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	FFC	Flexible Feature Code data.
CUST	xx	Customer number, as previously entered in LD 95 when configuring the CPND data block. xx = 0-99 for Options 51C-81C. xx = 0-31 for Option 11C.
...		
CODE	CPP	Configure a Flexible Feature Code for Calling Party Privacy.
CPP	xxxx	Enter the Flexible Feature Code for Calling Party Privacy.
...		

ISDN BRI implementation

LD 16 - Configure the method of Operation Coding for the Name Display supplementary services, for the associated QSIG ISDN BRI trunk route.

Prompt	Response	Description
REQ	NEW	Add new data (ISDN BRI protocol group settings).
TYPE	RDB	Route Data Block.

CUST	xx	Customer number, as defined in LD 15. xx = 0-99 for Options 51C-81C xx = 0-31 for Option 11C.
ROUT	0-511 0-127	Route number, for Options 51C-81C. Route number, for Option 11C.
TKTP	aaa	Trunk type.
DTRK	YES	Digital Trunk Route.
BRIP	NO	ISDN BRI packet handler route (NO is entered, since packet data is not required).
- DGTP	BRI	Digital trunk type.
ISDN	YES	Integrated Services Digital Network.
...		
IFC	ESGF ISGF	ESGF = ETSI QSIG interface with GF platform. ISGF = ISO QSIG interface with GF platform.
...		
RCAP		Enter the Operation Coding method for the QSIG Name Display supplementary services.
	NDO NDI	NDO = Coding by Object ID (IFC should be set to ESGF). NDI = Coding by Integer Value (IFC should be set to ISGF). Precede the entry with an 'X' to delete it. ***Note:*** NDO and NDI are mutually exclusive.
...		

LD 27 - Configure the Calling Line Presentation (CLIP) service, and Calling Line Identification presentation option in the Terminal Service Profile, for an ISDN BRI QSIG Digital Subscriber Loop (DSL).

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.

TYPE	TSP	Terminal Service Profile.
DSL	l s c dsl	Digital Subscriber Loop address, for Options 51C-81C. l (superloop) = 0-156 (must be zero or a number divisible by 4) s (shelf) = 0-1 c (card) = 0-15 dsl# (DSL location) = 0-7.
	c dsl	Digital Subscriber Loop address, for Option 11C. c (card) = 1-20. dsl# (DSL location) = 0-7.
...		
DN	xxx...x	Directory Number (1 to 7 digits) associated with the TSP.
- CLIP	(YES) NO	Allow or deny Calling Line Identification Presentation for Incoming Calls.
- PRES	(YES) NO	Allow or deny Presentation of Calling Line Identification to far end, for outgoing calls.
...		

Feature operation

No operating procedures are required to use this feature.

ISDN QSIG Path Replacement

Contents

The following are the topics in this section:

Regional material statement 1113
Feature description 1114
ISDN PINX DN 1115
Triangulation Path Replacement 1116
Anti-Tromboning Path Replacement 1117
Retaining Path Replacement 1118
Operating parameters 1119
Feature interactions 1120
Feature packaging 1122
Feature implementation 1122
Task summary list 1122
Feature operation 1127

Regional material statement

ISDN BRI trunking is not available in North America. Contact your system supplier or your Nortel Networks representative to verify support of this product in your area.

Feature description

ISDN QSIG Path Replacement allows an active connection through an ISDN QSIG private network to be replaced with more efficient connection. Path replacement service is invoked by the following triggers:

- QSIG Call Diversion (QSIG Call Diversion redirects Call Forwarding Busy, Call Forwarding No Reply and Call Forwarding Unconditional calls to another set over a QSIG network)
- Network congestion on the first Private Integrated Service Network Exchange (PINX) node
- Private Integrated Service Network Exchange (PINX) may be used interchangeably with Private Branch Exchange (PBX).
- Detection that the connected number differs from the called number

QSIG Path Replacement does not directly attempt to reduce the number of trunks involved in a call. This feature attempts to replace non-optimum paths across a QSIG network with an optimum path. The optimum path between to PINX nodes is the path which takes the first choice route to all PINXs. The optimum path is not set up until the terminating set answer the call.

ISDN QSIG Path Replacement uses the following replacement mechanisms: triangulation and anti-tromboning. These are described in more detail beginning on page 1116.

QSIG Path Replacement is permanently active on the PINX. This service is triggered internally or externally by another PINX. QSIG Path Replacement can be invoked on a mixed network of QSIG and Non-QSIG (such as MCDN). Path replacement uses the PINX_DN in the Customer Data Block as a rerouting number. Only QSIG interfaces are optimized. The Meridian Defined Customer Network (MCDN) is not optimized.

The section that follows discusses the use of Private Integrated Service Network Exchange (PINX) DNs as part of the Path Replacement feature.

ISDN PINX DN

The Path Replacement feature must scan the PINX nodes to find the optimum path to a remote PINX node. To accomplish this trunk optimization function, Path Replacement makes non-call associated requests (D-Channel messages only, no B-Channels are used) to the Path Replacement feature at the remote PINX node. The requests are not directed to any existing DN on the remote PINX node, but to a processing function on that PINX node.

To be able to route those types of calls through the network from one originating node to a destination node, an ISDN PINX DN must be defined for each PINX node in the network.

The ISDN PINX DN is a DN taken from the customer's numbering plan used to aid with the routing of network calls. It does not correspond to a real terminal on the node, so it is never busy. The ISDN PINX DN uses the same number of digits as the numbering plan; either UDP or CDP. It is defined so that the Path Replacement feature on a distant node can make non-call associated calls to the Path Replacement feature on another node when no particular destination exists. Those calls are made using existing routing configurations, e.g. a CDP distant steering code or a UDP location code expecting a fixed number of digits. For example, the far end PINX node has a digit sequence composed of the steering code plus the ISDN PINX DN with the same length and digit sequence used to route normal calls from the distant node to the local node for CDP type calls and location code plus a 4 digit ISDN PINX DN for UDP type calls.

One ISDN PINX DN should be configured per network location. This ISDN PINX DN is used for the Path Replacement feature and other features such as Electronic Lock Network Wide/Electronic Lock for Private Lines and Call Pickup Network Wide features.

No user or feature other than Path Replacement, Electronic Lock Network Wide/Electronic Lock for Private Lines and Call Pickup Network Wide features will be allowed to dial the ISDN PINX DN. If a user dials this DN, they will receive overflow tone.

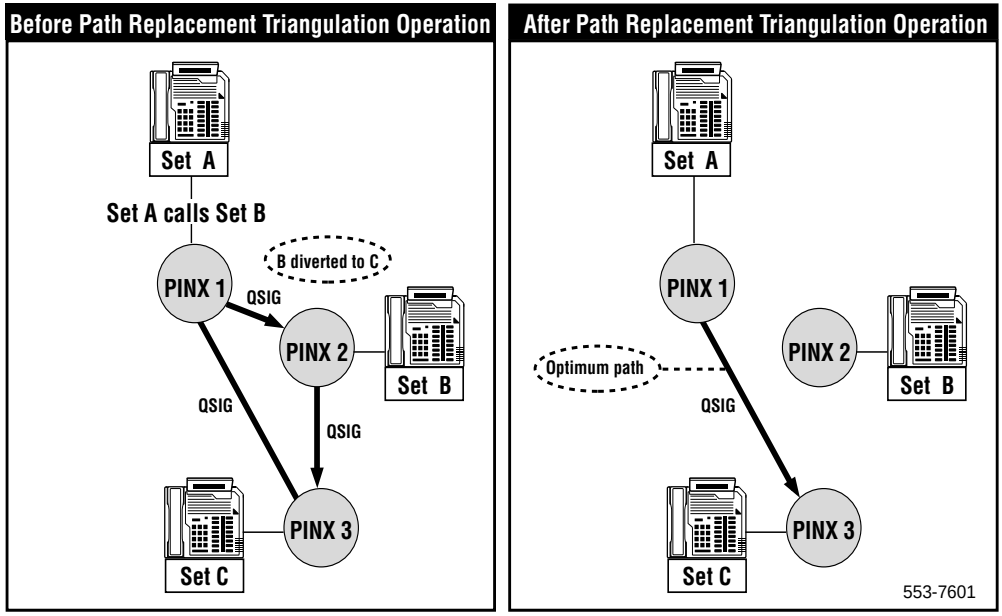
Triangulation Path Replacement

With Triangulation Path Replacement, either the originating or the terminating node involved in a QSIG call recognizes that a call is using a non-optimum path due to call diversion, network congestion or detection of a different number than dialed. If this call is still ringing, the originating/terminating node will wait for an answer signal before initiating triangulation path replacement. If the call is established, then replacement can be performed immediately.

The ISDN QSIG Path Replacement feature replaces non-optimum paths across a QSIG network with optimum paths. An optimum path between two nodes is the first choice route at all nodes.This feature does not attempt to reduce the number of trunks involved in call but does attempt to locate the optimum path.

As shown in Figure 90, Set A on PINX 1 calls Set B on PINX 2. Set B has activated Call Forward All Calls to Set C on PINX 3. Trunk optimization occurs between PINX 1 and PINX 3. Trunks between PINX 1 and PINX 2 and PINX 2 and PINX 3 are torn down after the call is answered by Set C.

Figure 90
Triangulation Path Replacement

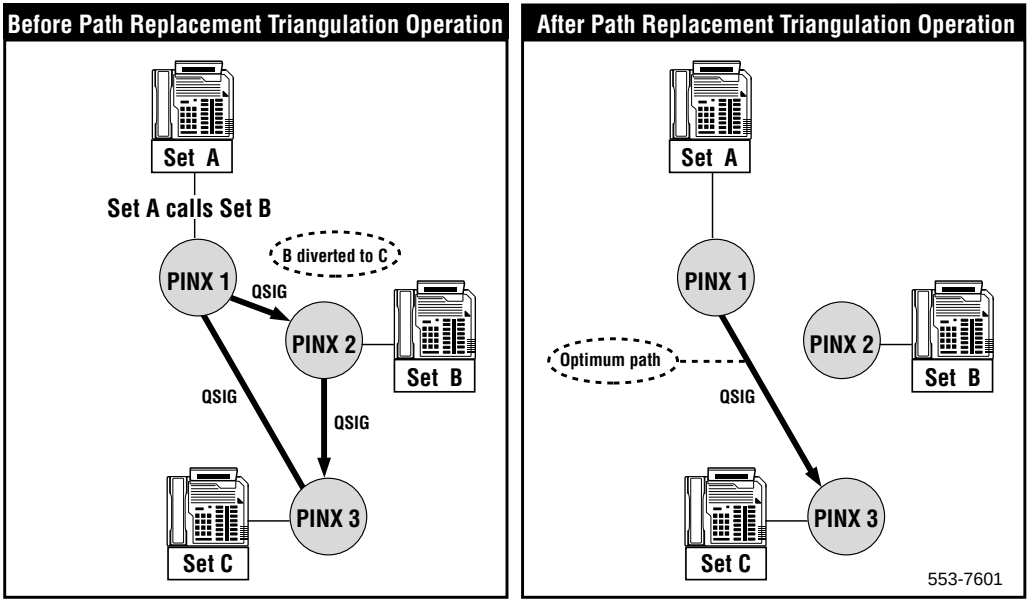


Anti-Tromboning Path Replacement

This feature performs anti-tromboning replacements to eliminate any dual parallel trunking that are caused by call modification. Anti-tromboning path replacement is only invoked after the divert-to caller answer the call. Anti-tromboning is only performed when all the trunks are associated with the same customer.

As shown in Figure 91, Set A on PINX 1 calls Set B on PINX 2. Set B has activated Call Forward All Calls to Set C on PINX 1. Antitromboning occurs between PINX 1 and PINX 2 and these trunks are torn down after Set C answers the call.

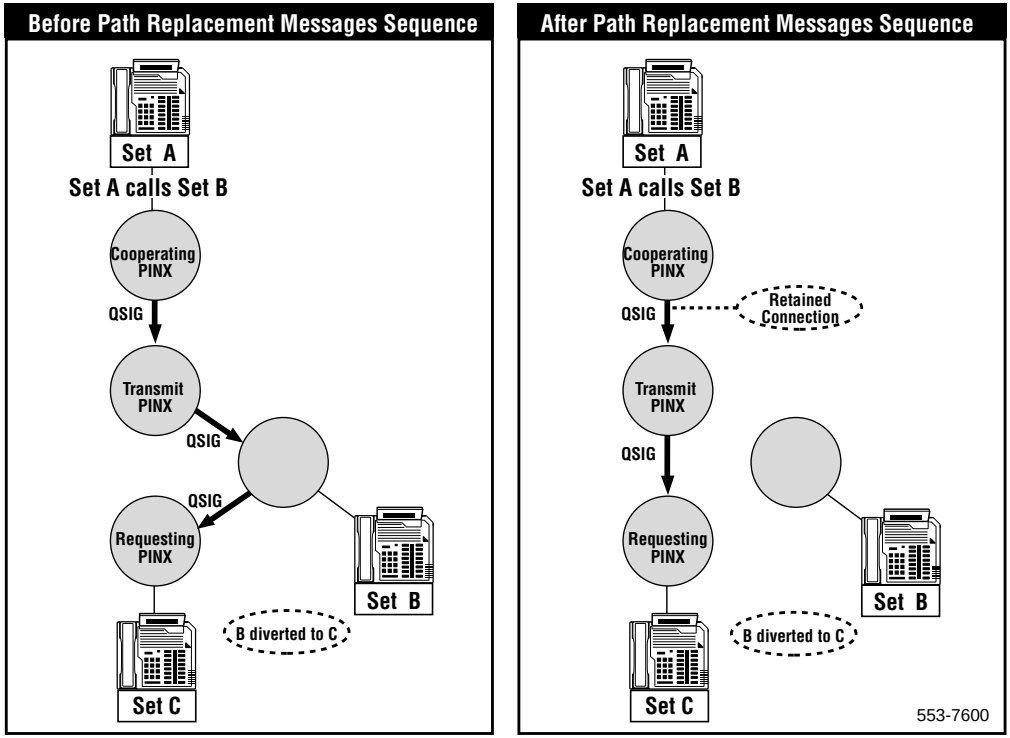
Figure 91
Tromboning Path Replacement



Retaining Path Replacement

When path replacement has been invoked, the cooperating PINX determines whether or not to retain part of the original connection provided that the original connection used the optimum route to reach the rerouted number. As shown in Figure 92, the connection between the cooperating and transit PINX is retained after path replacement has occurred.

Figure 92
Path Replacement Retaining Part of Old Connection



Operating parameters

Network congestion occurs when a non-optimum path from the first PINX node is detected.

When call diversion is not supported by a PINX node, path replacement is triggered when the connected number differs from the called party's number.

ISDN QSIG Path Replacement requires the Multi-Serial Data Link (MSDL) card.

This feature is only supported on Coordinated and Uniform Dialing Plans. Route Access Codes are not supported. Digit manipulation is not supported.

If a path replacement request is triggered and fails with the cause “invalid Rerouting Number” the request is discontinued. No attempt is made with another rerouting number.

When a call has several triggers for path replacement and the first trigger fails, no other attempts are performed using the other triggers. Path replacement triggers are chosen according to the following order:

1 QSIG Call Diversion

2 Congestion on the first PINX

3 Different Connected Number

The configuration of diversion and connected number triggers can generate a lot of path replacement collisions if the QSIG Call Diversion feature is configured on the QSIG network. In this situation, it is recommended that only the diversion trigger be configured. This establishes the optimized call in the same direction as the originating call.

New traffic reports are generated for QSIG Path Replacement. TSF009 reports traffic activity for D-channels and TFS011 reports traffic activity for Multi-Purpose ISDN Signalling processor for QSIG Path Replacement service.

Feature interactions

Attendant Console

Path replacement calls invoked by an attendant are not supported.

Attendant Barge In
Attendant Break In

The Attendant Barge In and Attendant Break In features are not supported during path replacement operation.

Automatic Call Distribution

ISDN QSIG Path Replacement calls placed in an Automatic Call Distribution (ACD) queue are initially rejected. Path replacements requests are accepted after the call is answered by an ACD agent.

Call Transfer

When a local is transferred by the Meridian 1 during an ISDN QSIG Path Replacement request, then the replacement request is terminated. After Call Transfer, the Meridian 1 may accept path replacement from another PINX. QSIG Call Transfer is not supported at this time.

Call Hold

Path Replacement cannot be invoked on a held call. Path replacement is only accepted on an active call.

Conference Calls

The Meridian 1 does not invoke path replacement when callers are involved in an established conference. Any replacement requests from a far end PINX are rejected when a call is on an established conference.

Customer Controlled Routing

Following a Customer Controlled rerouting, path replacement is only invoked by the connected number trigger.

Direct Inward System Access

Path replacement does not occur on a Direct Inward System Access (DISA) call. The Meridian 1 does not invoke the Path Replacement feature on DISA calls.

End-to-End Signalling

When End to End Signalling is detected the path replacement attempt is terminated. However, on Analog (500/2500 type) sets, replacement is not terminated because the Digit Tone Multi-Frequency (DTMF) generated by the set is detected.

Music
Radio Paging
Recorded Announcement

The Meridian 1 does not invoke the Path Replacement feature on Music, Paged or Recorded Announcement calls.

Feature packaging

The following packages are required for ISDN QSIG Path Replacement:

- Network Alternate Route Selection (NARS) package 58 (for Uniform Dialing Plan), or Coordinated Dialing Plan (CDP) package 59
- Flexible Numbering Plan (FNP) package 160
- QSIG Interface (QSIG) package 263
- QSIG-GF Transport (QSIGGF) package 305
- QSIG Supplementary Services (QSIG-SS) package 316
- Primary Rate Access (PRI) package 146
- 2.0 Mb Primary Rate Access (PRI2) package 154
- International Primary Rate Access (IPRA) package 202
- Multipurpose Serial Data Link (MSDL) package 222

ISDN Basic Rate Interface Trunk Access (BRIT) QSIG Interface requires:

- Basic Rate Interface (BRI) package 216
- ISDN Basic Rate Interface Trunk Access (BRIT) package 233

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 15 – Configure Private Integrated Services Network Exchange Directory Number.

2 LD 16 – Configure New Path Replacement parameters for an ISDN PRI or BRI trunk.

3 LD 17 – Configure QSIG Path Replacement for a QSIG ETSI or ISO interface.

LD 15 – Configure Private Integrated Services Network Exchange Directory Number**.**

Prompt	Response	Description
REQ:	CHG	Change existing data.
TYPE:	NET	Networking data.
CUST	xx	Customer number.
...		
ISDN	YES	Integrated Services Digital Network.
...		
- PINX_DN	xx...x	Private Integrated Services Network Exchange Directory Number, up to seven digits.

LD 16 – Configure New Path Replacement parameters for an ISDN PRI or BRI trunk.

Prompt	Response	Description
REQ	CHG NEW	Change existing data. Add new data.
TYPE	RDB	Route Data Block.
CUST	xx	Customer number.
ROUT	0 - 511 0-127	Route Number. For Option 11C.
...		
DTRK	YES	Digital Trunk Type.
- DGTP	PRI BRI	PRI trunk. BRI trunk.
- IFC	ESGF ISGF	ETSI QSIG interface with GF platform. ISO QSIG interface with GF platform.
...		
RCAP		Add Path Replacement as a remote capability.
	PRI PRO	PRI = The encoding method uses Integer values. PRO = The encoding method uses Object Identifier.
		PRI and PRO are mutually exclusive, and cannot be configured together at the same time on the same link.
		Precede PRI and PRO with X to remove. The previously configured PR parameters will be valid, if PR is deactivated and then reactivated.
...		

PR_TRIGS		Path Replacement Triggers.
	<CR>	<CR> = If REQ = NEW, the parameters are set to the default values, which are: DIV 2 3 (two PR attempts, with a three minute delay for Diversion triggers) CNG 2 3 (two PR attempts, with a three minute delay for Congestion triggers) XCON (Connected Number is not a trigger). If REQ = CHG, the Path Replacement parameters are not modified.
	DIV xx-y CNG xx-y CON xx-y	DIV = Diversion is used to trigger Path Replacement. CNG = Congestion is used to trigger Path Replacement. A Connected number different from a called number is used to trigger Path Replacement. where: xx = 0-(2)-15, the number of Path Replacement attempts (the default is two). If 0 is entered, the number will be set to infinite. yy = 1-(3)-7, the delay, in minutes, between two consecutive Path Replacement attempts (the default is three minutes). Precede DIV, CNG, and CON with X to remove the Path Replacement trigger.
PR_RTN	YES (NO)	Retain option is (is not) supported by the far end PINX.
...		

LD 17 – Configure QSIG Path Replacement for a QSIG ETSI or ISO interface.

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	CFN	Configuration Record.
ADAN	CHG DCH X	Change D-Channel number.
...		
- IFC	ESGF ISGF	ETSI QSIG interface with GF platform. ISO QSIG interface with GF platform.
...		
- RCAP	aaa	Add Path Replacement as remote capability where: PRI = Integer values as encoding method. PRO = Object identifier as encoding method. Precede with X to remove.
	DV3I DV3O	QSIG SS Call Diversion Notification remote capability. Configure sending of QSIG Diversion Notification Information, treatment of Rerouting request and coding of operations. If coded as Object Identifier, the remote capability ends with ‘O”, whereas for Integer Value, the remote capability ends with ‘I’. Only one remote capability is allowed. DV3I = Diversion information is sent to remote switch. DV3O = Rerouting requests from remote switch are processed. Precede with ‘X’ to remove capability, **but do not specify the coding type**. For example, XDV3 or XDV1 (and not XDV3I or XDV1O).
...		

PR_TRIGS		Path Replacement Triggers.
	<CR>	<CR> = If REQ = NEW, the parameters are set to the default values, which are: DIV 2 3 (two PR attempts, with a three minute delay for Diversion triggers) CNG 2 3 (two PR attempts, with a three minute delay for Congestion triggers) XCON (Connected Number is not a trigger). If REQ = CHG, the Path Replacement parameters are not modified.
	DIV xx-y CNG xx-y CON xx-y	DIV = Diversion is used to trigger Path Replacement. CNG = Congestion is used to trigger Path Replacement. CON = A Connected number different from a called number is used to trigger Path Replacement. where: xx = 0-(2)-15, the number of Path Replacement attempts (the default is two). If 0 is entered, the number will be set to infinite. yy = 1-(3)-7, the delay, in minutes, between two consecutive Path Replacement attempts (the default is three minutes).
PR_RTN	YES (NO)	Retain option is (is not) supported by the far end PINX.

Feature operation

No specific operating procedures are required to use this feature.

ISDN Semi Permanent Connections for Australia

Contents

The following are the topics in this section:

Regional material statement 1129
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Regional material statement

The information presented in this section does not pertain to all market regions. Contact your system supplier or your Nortel Networks representative to verify support of this product in your area.

Feature description

The ISDN Semi Permanent Connections (ISPC) feature allows a number of B-channels, through an Australian ISDN Central Office (CO), to be permanently connected between Meridian 1 PBXs (nailed up B-channels). These connections are used transparently by the ISDN Signaling Link (ISL) as if they were leased lines or channels on a TIE trunk.

ISL calls between PBX end users linked by the permanent connections are performed using all capabilities provided by Meridian Customer Defined Network (MCDN) features. Other possibilities provided by this feature are to use ISPC links to convey D-channel signaling between Meridian 1 PBXs.

ISL calls through an established ISPC link use two trunks. The physical trunk is the permanent connection initiated by the Central Office between both PBXs on the B-channel of a PRI2 trunk. The logical trunk is an intermediate data structure without any associated hardware. This trunk is also referred to as the Phantom DTI2 trunk.

The physical trunk allows an ISPC link to be established between the PBXs; whereas, the logical trunk allows end users to perform calls, using established ISPC links.

Semi Permanent Connection Links to convey D-Channel Signals

An ISPC link can be used to convey D-channel signaling. However, D-channel signaling requires a different configuration than the ISPC link used by the ISDN Signaling Link (ISL). Both sides of an ISPC link that convey D-channel signaling must be equipped with either a Meridian 1 Communication Adaptor (MCA) or a Meridian 1 Communication Unit (MCU) data interface.

The Dial Tone Detection feature allows the data interfaces at each end of the ISPC links to synchronize. For synchronization to occur, one side of the ISPC link must be defined as MASTER and the other side must be defined as SLAVE.

Master Side

The data interface, connected to the D-channel, must be configured in autodialing mode. The dialing sequence configured on the MASTER SIDE, rings the data interface on the SLAVE SIDE of the ISPC link through the associated route of the Phantom TN. The Dial Tone Detection feature must be configured for this route so that dial tone is provided by the SLAVE SIDE of the ISPC link. The dial tone indicates to the MASTER SIDE that both legs of the ISPC link have been successfully setup by the Central Office.

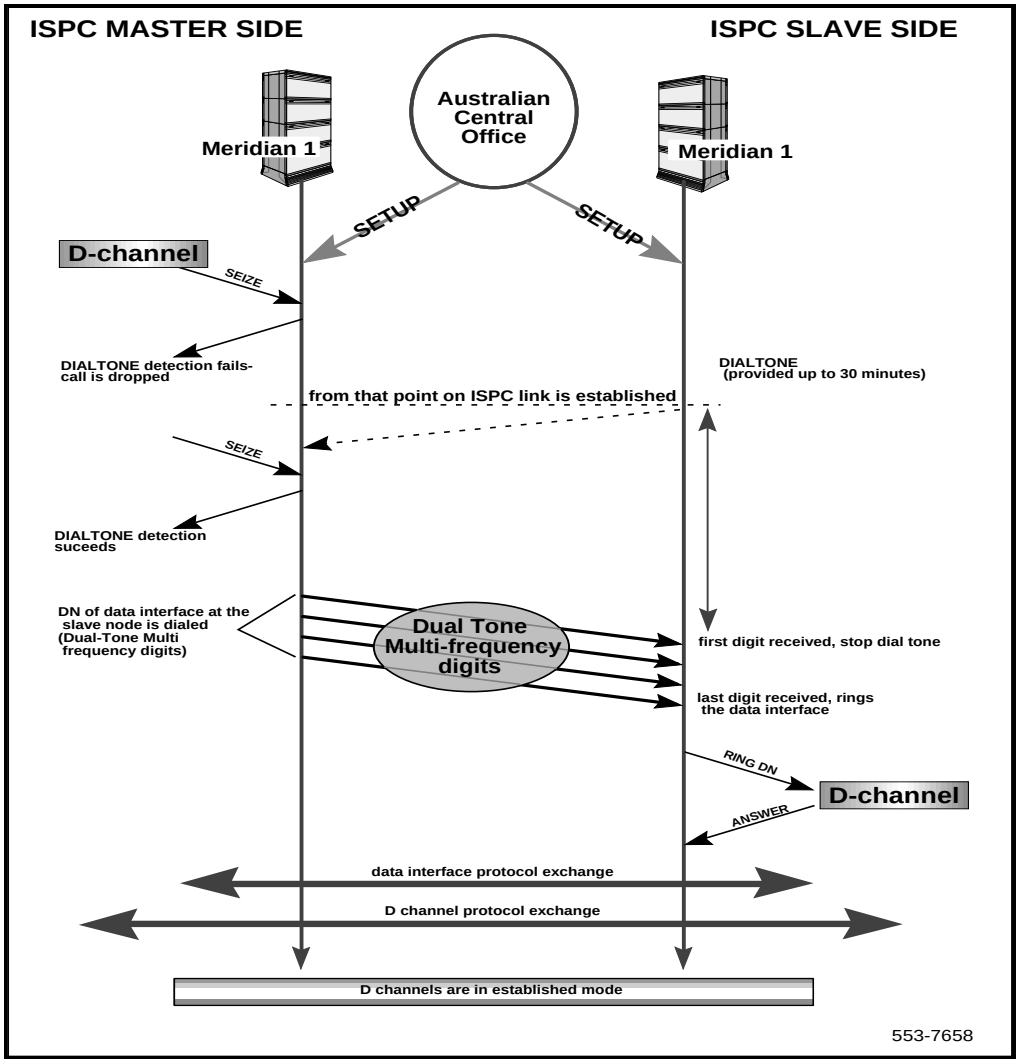
As illustrated in Figure 93, when the data interface initiates its dialing sequence, a path is set between the interface and the ISPC link. If no dial tone is detected, the path is released. Additional attempts are performed by the data interface because it has been configured in autodialing mode. When the dialing tone is successfully detected, the Directory Number associated to the data interface used on the ISPC SLAVE SIDE, is dialed through the ISPC link using Dual Tone Multi-Frequency (DTMF) tones.

Slave Side

The data interface connected to the SLAVE SIDE must be configured to autoanswer mode. When an ISPC link is established, a path is made with a TDS card to provide Dial Tone to the ISPC link, and DTMF digits are expected. The DTMF digits identify the Directory Number where the data interface that is to ring is connected. When the data interface on the SLAVE SIDE is rung, it answers and initiates its own protocol sequence and D-channels can be established.

After 30 minutes of unsuccessful attempts to connect, the path between the ISPC link, the TDS card and the DTR cards is removed, provided that the default mode is set to “MANUAL and 1 attempt”. A technician can change these default parameters in LD 96.

Figure 93
Mechanism Used to Synchronize Data Interfaces



Operating parameters

For this feature, Meridian 1 users must initially subscribe for ISPC services from Telecom Australia. ISDN Semi Permanent Connections (ISPC) service is only available from Telecom Australia on Central Office (CO) and Direct Inward Dialing (DID) trunks.

The ISPC feature is based on the Asia Pacific ISDN protocol for Australia. The ISPC requires PRI2 connections to an Australian Central Office using Asia-Pacific ISDN connectivity for Australia.

ISPC is not supported over Basic Rate Interface (BRI) trunks or AXE-10 Australia Primary Rate Interface connectivity.

Data interfaces, supported when the ISPC links are configured to convey D-channel signaling to forward signals from MSDL, DCHI or DDCHI card ports into the Meridian 1, are Meridian Communication Unit (MCU) and Meridian Communication Adapter (MCA).

Integrated Signaling Links (ISL) in a D-channel configured shared or dedicated mode are supported.

ISPC reference numbers, provided by Telecom Australia, are limited to a maximum of seven digits.

Established ISPC links are only used in conjunction with the ISL feature functionality. Therefore, ISPC links are interpreted as available TIE trunks with an established ISL D-channel.

Outband signaling, through an ISL D-channel, is required to control the usage of established ISPC links. When an ISPC link conveys D-channel signaling, a special mechanism based on the Dial Tone Detection feature is used.

The number of established ISPC links on a PRI2 loop is limited to the number of configured links and the idle B-channels on the loop.

Each ISPC link requires an associated TN defined on a Phantom DTI2 loop.

Established ISPC links cannot be used for Virtual Network Services (VNS) bearer trunks.

ISPC links are established by the Australian Central Office (CO) as a 64kbps cleared data link.The CO and Meridian 1 PBXs do not provide a mechanism for echo cancellation for ISL calls using ISPC links.

The Phantom DTI2 trunks used by this feature must belong to the same group as the real PRI2 trunk.

When establishing an ISL D-channel between two Meridian 1 PBXs, the following hardware is required:

- D-channel (DCH), Dual Density D-channel (DDCHI) or Multi-Serial Data Link (MSDL) card on each Meridian 1 site;
- Meridian Communication Unit (MCU) or Meridian Communication Adapter (MCA) on each site for the exchange of D-channel signaling between sites; and
- Tone Detector Card (XTD or DTD) on one site and a Tone Generation Card (XCT or TDS) at the other site in situations where at least one ISPC link is used to convey D-channel signaling.

Feature interactions

Attendant Barge-In

When an attendant attempts to Barge-In on 2.0 Mbps Primary Rate Interface B-channel used as an ISPC link with the Central Office, a fast busy tone is provided.

Attendant Incoming Call Indicators

Calls using an ISPC link are always presented as calls over TIE trunks.

Call Detail Recording

Calls using an established ISPC link are identified by the calling party, called party, time and duration of call. Call Detail Recording tickets are not generated for the ISPC links that have been established.

Call Forward by Call Type

ISPC calls are handled according to the configuration of the route associated to the phantom trunk TN. This configuration is independent of the route associated to the real TN.

Dial Tone Detection

To convey D-channel signaling over an ISPC link, the route associated to the link at the Meridian 1 configured as MASTER must detect a dialtone.

Distinctive New Distinctive Ringing

For ISPC calls, Distinctive/New Distinctive Ringing is provided according to the configuration of the route associated to the phantom trunk TN. This configuration is independent of the route associated to the real TN.

Integrated Service Digital Network Signaling Link

Redirection or optimization of calls will not release established ISPC links.

Trunk Barring

For calls using or requesting an ISPC link, Trunk Barring is provided according to the configuration of the route associated to the phantom trunk TN. This configuration is independent of the route associated to the real TN.

Feature packaging

ISDN Semi Permanent Connection for Australia requires the following packages:

- 2.0 Mb Digital Trunk Interface (DTI2) package 129;
- ISDN Signaling Link Package (ISL) package 145; and
- ISDN Semi Permanent Connection for Australia (ISPC) package 313.

The following packages are required for Asia-Pacific ISDN Primary Rate:

- Integrated Digital Services Network (ISDN) package 145;
- 2.0 Mb Primary Rate Interface (PRI2) package 154;
- International PRA (IPRA) package 202;
- Intelligent Peripheral Equipment (XPE) package 203; and
- Multi-Purpose Serial Data Link (MSDL) package 222

The following packages are required for an ISPC link to convey D-channel signaling:

- Dial Tone Detector (DTD) package 138 (for MASTER nodes only); and

- International Supplementary Features (SUPP) package 131 (for SLAVE nodes only).

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 17 – Configure Phantom Loops .

2 LD 73 – Configure Signaling Categories used for ISPC links

3 LD 16 – Configure Route Data Block for ISPC link.

4 LD 14 – Configure Phantom Trunk Terminal Numbers.

5 LD 11 – Configure Data Interface.

6 LD 13 – Configure Dial Tone Detection on Master Side Meridian 1

7 LD 96 – D-Channel Message Monitoring

Following subscription to the ISDN Semi Permanent Connections (ISPC) service from a Telecom entity, the overlays listed below are used to configure ISPC links when they are used to convey D-channel signaling or used for ISL calls.

For both cases:

- at least one Phantom DTI2 loop must be defined in LD 17; and
- a specific SICA Table must be defined in LD 73.

ISPC links used for ISL calls:

- Configure a TIE ISL Route in LD 16; and
- For each ISPC Link, a TN on the Phantom DTI2 loop must be defined in LD 14.

ISPC links used to convey D-channel signaling:

- The configuration is asymmetrical. One side of the link is defined as MASTER and the other is defined as SLAVE.
- On the MASTER SIDE:
  - — Configure Dial Tone Detection Feature in LD 13;

— Configure Direct Inward Dialing route (non-ISL) in LD 16;

— Configure Meridian Communication Adaptor or Meridian Communication Unit in LD 11; and

— Define one TN on Phantom DTI2 loop in LD 14

- On the SLAVE SIDE:

— Configure Direct Inward Dialing route (non-ISL) in LD 16;

— Configure Data Interface in LD 11; and

— Define one TN on the Phantom DTI2 loop in LD 14.

It is assumed that the ISL D-channel has been configured (LD 16). The following settings are recommended: RS-232 for 19.2 kbps and below, HS (RS-422) for speeds above 19.2 kbps, MCA/MCU configured as 64 kbps and DTE device configuration.

Note: ISPC uses a new set of commands in LD 96 to monitor the SLAVE SIDE. These new commands are STAT ISPC lp ch, EST ISPC lp ch and RLS ISPC lp ch. Additionally, in LD 60, the STAT command identifies the channel used as ISPC link to a PBX by indicating the ISPC mnemonic.

LD 17 – Configure Phantom Loops .

Prompt	Response	Description
REQ	CHG	Change.
TYPE	CEQU	Change Common Equipment Parameters.
...		
- DTI2	xx	2.0 Mb Digital Trunk Interface or DTI loop number. Precede loop with an “N” to configure this loop as a phantom loop for trunks.

LD 73 – Configure Signaling Categories used for ISPC links

Prompt	Response	Description
REQ	NEW	Create new data block.
TYPE	DTI2	2.0 Mb DTI data block.
FEAT	ABCD	ABCD Signaling category feature.
SICA	2 - 16	Signaling Category table number.
DFLT	1	Default signaling category used for default tables. For phantom DTI2 trunks choose Table 1 as default table.
Prompts for Incoming/Outgoing Calls.		
IDLE (S)	1001	Idle (sender).
IDLE (R)	1001	Idle (receiver).
Incoming Calls		
...		
SEZA (S)	N	Seize signal acknowledgment sent. For phantom DTI2 trunks, SEZA (S) is not configured.
...		
E CONN (S)	(1001)	Connect send. CONN (S) must be the same as IDLE (S) for phantom DTI2 trunks.
CONN (R)	(1001)	Connect received. E CONN (R) must be the same as IDLE (R) for phantom DTI2 trunks.
...		
C CLRB (S)	N	Clear Back send signal. For phantom DTI2 trunks, there is no C CLRB signal.
...		

Outgoing Calls		
...		
SEZA (R)	N	Seize signal acknowledgment received. For phantom DTI2 trunks, SEZA (R) is not configured.
...		
CONN (S)	1001	Connect send. E CONN (S) must be the same as IDLE (S) for phantom DTI2 trunks.
E CONN (R)	1001	Connect received. E CONN (R) must be the same as IDLE (R) for phantom DTI2 trunks.
...		
C CLRB (R)	N	Clear Back.

LD 16 – Configure Route Data Block for ISPC link.

Prompt	**Response**	**Description**
REQ	NEW	New route.
TYPE	RDB	Route Data Block.
CUST	xx	Customer number.
ROUT	xx	Route Number.
The following prompts must be answered when ISPC link is used for ISL calls		
TKTP	TIE	TIE Trunk Route Type. TIE trunks must be used for ISPC links used for ISL calls.
...		
DTRK	YES	Digital Trunk Route.
...		

- DGTP	DTI2	2.0 Mbps Digital Trunk Interface. ISL route that uses Phantom Trunk TN's must be configured as DTI2 routes.
ISDN	YES	Integrated Services Digital Network. ISDN must be set to YES for ISL signaling to control ISPC link usage.
- MODE	ISLD	Route uses ISDN Signaling Link. ISDN is allowed only if ISDN = YES and ISL package 147 is equipped.
- DCH	1 - 63	D-channel Port Number that controls ISPC links usage.
- IFC	SL1	Interface type for PRI route. Connection is direct to another Meridian 1 PBX.
- PNI	(0) - 32700	Private Network Identifier. Each customer data block must use a unique PNI when equipped with multi-customer option. It must match the PNI in the far end Customer Data Block to support Network Ring Again, Network ACD and Network Message Service features.
...		
ICOG	IAO ICT OGT	Incoming and outgoing trunk, Incoming trunk only, or Outgoing trunk only.
...		
ACOD	xxxx	Trunk Route Access Code. ACOD must not conflict with numbering plan. The code entered can be up to four digits or up to seven digits, if the DNXP package 150 is equipped.
The following prompts must be answered when ISPC link is used to convey D-channel signaling		
TKTP	DID	Trunk Route Type. DID must be used when associated with an ISPC link used to convey D-channel signaling.
...		
DTRK	YES	Digital Trunk Route.

...		
- DGTP	DTI2	2.0 Mb Digital Trunk Interface.
ISDN	NO	Integrated Services Digital Network PRI option.
- DSEL	DTA	Data selection. DTA is configured as “data only” when ISPC link is used to convey D-channel signaling.
ICOG	IAO OGT ICT	Incoming and outgoing trunk, Outgoing trunk only, or Incoming trunk only. ICOG configuration is dependent on the side of the ISPC link with which the route is to be associated. On the MASTER side (SMAS = YES in LD 14), ICOG = OGT or IAO. On the SLAVE side (SMAS = NO in LD 14), ICOG = ICT or IAO.
...		
ACOD	xxxx	Trunk Route Access Code. ACOD must not conflict with numbering plan. The code entered can be up to four digits or up to seven digits, if the DNXP package 150 is equipped.
...		
CNTL	YES	Change to Controls or Timers. CNTL must to answered to trigger DTD prompt.
...		
- DTD	YES	Dial Tone Detection provided. On MASTER side of ISPC link (SMAS = YES in LD 14) DTD = YES.
...		
NEDC	ETH	Near End Disconnect Control.
FEDC	ETH	Far End Disconnect Control.
CPDC	NO	Meridian 1 is not the only controlling party on incoming calls.

DLTN	NO	Dial Tone on originating calls provided on this route. On SLAVE side of ISPC link (SMAS = NO in LD 14) DLTN = YES.
...		
PRDL	BSY	Busy signal is sent on time-out. The PRDL prompt must be set to “BSY” in order to disconnect ISPC phantom DTI2 trunks when an incomplete or invalid DN is received on the ISPC SLAVE D-channel.

LD 14 – Configure Phantom Trunk Terminal Numbers.

Note: ISPC Reference Numbers supplied by Telecom entity must be associated with Phantom Trunk TNs defined in LD 14.

Prompt	**Response**	**Description**
REQ	CHG, END, NEW x, OUT x	Change existing data block, exit overlay program, add new data block (1-255) or remove data block (1-255).
The following answers are required when ISPC link is used for ISL calls.		
TYPE	TIE	Trunk type.
TN	l s c u	Terminal Number.
	c u	For Option 11C.
...		
SICA	1 - 16	Signaling Category Table Number configured in LD 73.
...		
RTMB	0-511 1-510 0-127 1-510	Route number and member number, for Options 51C-81C. Route number and member number, for Option 11C.
CHID	1-382	ISL Channel Identification for trunk. A different channel is required for each phantom TN used for the ISPC links. The same Channel ID must be configured for the ISPC reference number on both Meridian 1 PBXs linked by the connection.
...		
TKID	nnnnnnn	Trunk Identifier.

SREF	XXXXXXX	Semi Permanent Connection Reference Number as defined by the Telecom administration at subscription. Reference number can be a maximum of seven digits. SREF is prompted only when Trunk TN is on a phantom loop.
SDCH	NO	The ISPC link is not used to convey D-channel signaling.
...		
The following answers are required when ISPC link is used to convey D-channel signaling		
TYPE	DID	Trunk type.
...		
SICA	1 - 16	Signaling Category Table Number configured in LD 73.
...		
RTMB	0-511 1-510 0-127 1-510	Route number and member number, for Options 51C-81C. Route number and member number, for Option 11C.
...		
CLS	DTN	Digitone Class of Service. CLS = DTN for ISPC link to convey D-channel signaling.
...		
SREF	yy..yy	ISPC Reference Number(s) supplied by Telecom entity to a maximum of 7 digits.
SDCH	YES	ISPC link used to convey D-channel signaling. For SMAS prompt to be displayed, SDCH = YES.
SMAS	(NO) YES	Data Interface over the ISPC link is MASTER or SLAVE. YES = ISPC link is on MASTER side. NO = ISPC link is on SLAVE side. One side of the ISPC link **must** be configured with SMAS = YES and the other side with SMAS = NO.

LD 11 – Configure Data Interface.

Prompt	Response	Description
REQ:	NEW	Add.
TYPE:	aaaa	Meridian Modular Telephones (MMT) types equipped with Meridian Communication Adapter (MCA) or Meridian Communications Unit (MCU). Where aaaa = 2006, 2008, 2216, 2616 or MCU.
...		
CLS	DTA	Class of Service Data Terminal.
...		
DTAO	MCA	Data Option software for Meridian Communications Adaptor (MCA) that determines the downloaded data, system and operating parameters. The DTAO prompt appears for all Meridian Modular Telephone data ports except MCU.
...		
OPE	YES	Change data port parameters.
- PSDS	NO	Public Switched Data Service (PSDS) option.
- TRAN	SYN	Synchronous data transmission.
...		
The following is for the MCA/MCU used on the MASTER side of the ISPC link.		
- HOT	ON	Enable Hotline for data port.
...		
- BAUD	0-(11)-12	Data rate in bps for the data port. Baud rate 12 (64 kbps) is recommended.
...		
KEY	0 SCR yyyy	Single Call Ringing key used by Hotline, where: 0 = Key number, SCR = Single Call Ringing, yyyy = DN.

KEY	3 ADL yy z...z	Autodial key used by hotline feature, where: 3 = Key number, ADL = Autodial, yy = maximum DN length and z....z = DN preceded by route access code of the Data Interface on the ISPC SLAVE side of link.
The following is for the MCA/MCU used on the SLAVE side of the ISPC link.		
- HOT	OFF	Hotline feature disabled.
- AUT	ON	Autoanswer.
- BAUD	12	Data rate for 64 kbps.
...		
KEY	0 SCR yyyy	Single Call Ringing key, where: 0 = Key number, SCR = Single Call Ringing, yyyy = DN. The Autodial Key on the MASTER side must be configured to access this DN.

LD 13 – Configure Dial Tone Detection on Master Side Meridian 1

Prompt	**Response**	**Description**
REQ	NEW	Add data block for Digitone Receiver.
TYPE	aaa	Type of data block, where aaa = DTD (Dial Tone Detector) or XTD (Extended Dial Tone Detector).
TN	l s c u	Terminal number of tone detector card.
	c u	For Option 11C.

LD 96 – D-Channel Message Monitoring

Commands	Description
STAT ISPC l ch	Get status of data interface establishment process at an ISPC SLAVE side of an ISPC link (where l = loop and ch = channel) which is configured to convey D-channel signaling. The status may be: 1. DISABLED = ISPC link is disabled 2. AWAITING ESTABLISHMENT = the data interface establishment process is waiting to receive DTMF digits. While waiting, dial tone is provided to the ISPC link at the SLAVE side. 3. RELEASED = the data interface establishment process is stopped because either an “RLS ISPC” command has been entered or because the maximum number of tries has been reached. 4. ESTABLISHED = data interfaces at both ends of the ISPC link are established. 5. AWAITING RELEASE = the ISPC link is being disconnected. Once disconnected, the link will transition to the “RELEASED” state. The mode may be: 1. MODE MANUAL N = the data interface establishment process is running with up to “N” number of tries 2. MODE AUTOMATIC = the Meridian 1 provides dial tone to the ISPC slave D-channel. Establish data interface process at the ISPC SLAVE side of an ISPC link at loop (l) and channel (ch), where “N” = the “number of tries” counter. The actual range of N = 0-(1)-255. When N = 0, the mode is set to AUTOMATIC. This mode requires one TDS slot and one DTR unit. This mode is not recommended for use on small systems or systems loaded with heavy traffic. When N > 0, the process is activated for a period of up to N * 30 minutes. The available range goes from 30 minutes (N = 1) to 128.5 hours or 5 days (N = 255). If no value is entered for N, it defaults to a value of 1. When N = 1, one attempt will be made to establish the data interface process before the ISPC slave D-channel is released.
RLS ISPC l ch	Stop the data interface establishment process. When this command is entered, the mode becomes MANUAL and the number of attempts to be performed = 0.

Feature operation

No specific operating procedures are required to use this feature. However, the following steps must be performed to operate ISDN Semi Permanent Connections for Australia.

1 Subscribe for ISDN Semi Permanent Connections (ISPC) service from Telecom entity.

2 Install hardware for ISPC links usage (if required).

3 Configure Meridian 1 PBXs for ISPC links usage.

4 Wait for ISPC links to be established.

5 Wait for ISL D-channel to be established (if using).

6 Perform call via established ISPC links.

ISDN Signaling Link

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Feature description

ISDN Signaling Link (ISL) provides the capability to replace both digital and analog conventional trunk signaling with out-of-band ISDN D-channel signaling.

When the D-channel is inactive, ISL trunk calls can automatically revert to conventional trunk signaling. This applies to both primary and backup D-channels.

ISL supports TIE and ISA trunk types with Meridian 1 to Meridian 1 connectivity.

The TIE lines and trunk used for the D-channel may be leased from the Central Office (CO). With leased lines, the function of the CO is simply to provide the trunk wire facilities between Meridian 1 systems for circuit switched connections.

The ISDN Signaling Link supports a uniform trunk hardware configuration. This configuration uses the QPC237 4-wire E&M TIE trunk card in place of other analog trunk cards (such as the QPC71 TIE trunk card or the QPC72 DID/DOD trunk card).

> ***Note:*** If the QPC237 TIE trunk card is not used, backup D-channel is not available.

There are two modes of ISL operation:

- Shared mode: The DCHI supports ISDN PRI signaling and ISL trunks. The configuration is basically the same as the PRI D-channel, with the D-channel also supporting ISL trunks.
- Dedicated mode: The DCHI does not support ISDN PRI signaling. The DCHI is reserved for ISL use. The D-channel can communicate with the far end by means of a dedicated leased line, dial-up modem, or DTI/PRI trunk.

For ISL to use an ISA route, the ISA route must be identified as ISL in LD16. This is done by assigning the MODE prompt to ISLD.

When an ISL call utilizes a Call-by-Call Service, the D-channel associated with the ISA route for the Call-by-Call Service is used for signaling.

> ***Note:*** The High Speed Data Module (HSDM) is used in place of both the Asynchronous/Synchronous Interface Module (ASIM) and the Add-On Data Module (ADM).

Reverting to conventional trunk signaling

This feature handles ISL trunk calls by reverting to conventional trunk signaling when the D-channel is inoperative. This applies to the primary and backup D-channels as well as ISA.

When a primary or backup D-channel goes down:

- Established ISL calls remain established, regardless of the signaling method used.
- Transient ISL calls that are set up using conventional trunk signaling are not disturbed.

- Transient ISL calls that are set up by means of D-channel signaling are dropped. The user must reinitiate the call. Then conventional trunk signaling is used if the D-channel remains inactive.
- ISL channels are not marked maintenance busy.

There are two scenarios that can occur when a D-channel is re-established, one with backup D-channel and one without. When a backup D-channel re-establishes:

- There is no impact. The other D-channel simply recovers. Since ISL calls still using D-channel signaling (in existing software) can bypass the restart procedure.

When a D-channel re-establishes that does not have a backup:

- Transient and established ISL calls that are set up using conventional trunk signaling are not disturbed.
- Established ISL calls that are set up using D-channels are disconnected.
- To disconnect an established ISL call, the system uses the same signaling method that the call was setup with.

When the ISL D-channel goes down, the following scenario occurs. Since ISL trunks can convert to conventional trunk signaling, the ISL route (which is associated with a D-channel) is bypassed using conventional trunk signaling.

This package allows for the configuration of the NTAK02 as an ISDN Signaling Link (ISL), and for the transport of CLID and ESN/ISDN features.

This link provides ISDN Feature Networking Services to locations in a customer's network where a DTI/PRI link is not available or not economically justified.

The ISL uses a dedicated channel at speeds between 2.4 to 64 Kbps to establish the ISDN "D" channel for transmission of the ISDN Q.931 signaling protocol. The D-channel information is transported to the far end using one of the following methods:

- a PRI channel in the case of ISL shared mode (in the same manner as PRI)
- a data adapter or modem in the case of ISL dedicated mode

The associated voice or data is sent over the existing conventional analog or digital trunks.

> ***Note:*** Auto recovery for ISL tie trunks to revert back to in-band signaling upon failure of the D-channel Handler Interface is available on Meridian 1 systems.

Operating parameters

There are no operating parameters associated with this feature.

Feature interactions

ISDN QSIG Basic Call

ISDN Signaling Link (ISL) on QSIG operation is not supported on ISDN BRI trunking for Options 51C to 81C. For Option 11C, ISL on QSIG is not supported.

ISDN Semi Permanent Connections for Australia

Redirection or optimization of calls will not release established ISDN Semi Permanent Connections links.

Feature packaging

The ISDN Signaling Link (ISL) package 147, which is dependant on ISDN package 145.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 17 – Configure the D-Channel for ISL

2 LD 15 – Define a PRI customer and networking data.

3 LD 16 – Enable ISL on a per route basis.

4 LD 14 – Assign a channel identification to each trunk with the ISL option.

There are two modes of ISDN Signaling Link (ISL) operation:

1 **Shared mode**
The DCHI supports ISDN PRI signaling and ISL trunks. The configuration is basically the same as the PRI D-channel, with the D-channel also supporting ISL trunks.

2 **Dedicated mode**
The DCHI does not support ISDN PRI signaling. The DCHI is reserved for ISL use. The D-channel communicates with the far end by means of a dedicated leased line, dial-up modem, or DTI/PRI trunk.

ISDN Signaling Link (ISL) supports Calling Line Identification (CLID) and CLID in Call Detail Recording (CDR), Electronic Switched Network (ESN) interworking, and Network Ring Again (NRAG) applications. The ISL service is supported in the uniform trunk hardware configuration. For call-by-call service, an ISA route must be established and identified with the ISL interface.

LD 17 – Configure the D-Channel for ISL

Prompt	Response	Description
REQ	CHG	Change.
TYPE	CFN	Configuration Record.
ADAN	NEW DCH x	Add a primary D-channel (can also CHG and OUT DCH).
CTYP	DCHI MSDL	Card type.
DNUM	xx	Device number: physical port (odd) for D-channel on DCH, physical card address for MSDL.
- PORT	0-3	Port number on MSDL card or Downloadable D-Channel Daughterboard (for Option 11C).
USR	PRI ISLD SHA	Primary Rate Interface Integrated Services Signaling Link Dedicated. Shared mode.
- ISLM	1-382	Number of ISL trunks controlled by the D-Channel.

DCHL	xx	PRI loop number for DCHI or MSDL. Card number for Option 11C.
OTBF	1-(32)-127	Number of output request buffers.
- BPS	xxxx	Baud rate for ISL D-channel on MSDL port (default 64000).
- PARM	R232 R422 DCE DTE	ISL D-channel interface and transmission mode (MSDL port only).
PRI	xxx yy	Additional PRI loops (cards for Option 11C) using the same D-channel, and interface ID.
DRAT	(56K) 64KC 64KI	D-channel transmission. 56 Kbps, default when LCMT (LD17) is AMI. 64 Kbps clear, default when LCMT (LD17) is B8S. 64 Kbps inverted HDLC (64 Kbps restricted. DRAT is not prompted when configuring ISL D-channels because the speed is controlled by the modem baud rate.
IFC	aaa	Interface type: (D100), D250, ESS4, ESS5, SL1, S100.
SIDE	(USR) NET	Meridian 1 node type.
RLS	xx	Release ID of the switch at the far end of the D-Channel.
RCAP	aaa	Remote D-channel capabilities: MSL, NCT, ND1, ND2, RVQ.
- CLOK	(EXT) INT	Internal or external clock on ISL D-channels.
LAPD	(NO) YES	D-channel LAPD parameters.
- T23	1-(20)-31	Interface guard timer (DCHI only)
- T200	2-(3)-40	Retransmission timer
- N200	1-(3)-8	Maximum number of retransmissions
- N201	4-(260)	Maximum number of octets in information field
- T203	2-(10)-40	Maximum time (in seconds) without frames being exchanged
- K	1-(7)	Maximum number of outstanding frames

ADAN	NEW BDCH x	Add a backup D-channel. x = 0-63.
PDCH	0-63	Primary D-channel
CTYP	DCHI MSDL	Card type.
DNUM	0-15	Physical port (odd) for D-channel, card number for MSDL.
- PORT	0-3	Port number on MSDL card.
BCHL	xxx	PRI loop number for backup D-channel. Card number for Option 11C.
RCVP	(NO) YES	Auto-recovery to primary D-channel option.

LD 15 – Define a PRI customer and networking data.

Prompt	**Response**	**Description**
REQ:	NEW CHG	Add, or change.
TYPE:	NET	Networking data.
CUST	xx	Customer number.
...		
- ISDN	YES	Integrated Services Digital Network.
- PNI	1-32700	Private Network Identifier (for CLID).
- PFX1	xxxx	Prefix (area) code for International PRA (for CLID).
- PFX2	xxxx	Central Office Prefix for IPRA (for CLID).
- HNPA	100-999 100-319	Home Number Plan Area code (for CLID). For Option 11C.
- HNXX	100-999 100-319	Prefix for Central Office (for CLID). For Option 11C.
- HLOC	100-9999 100-3199	Home Location Code (ESN) (for CLID). For Option 11C.

- LSC	xxxx	Local steering code (for CLID).
- CNTP	(PDN) LDN	Default for Calling Line ID (CLID).
- RCNT	0-(5)	Maximum inter-node hops in a network redirection call.

LD 16 – Enable ISL on a per route basis.

Prompt	Response	Description
REQ	NEW	Add a PRI trunk route.
TYPE	RDB	Route Data Block.
CUST	xx	Customer number.
ROUT	xx	Route number.
TKTP	ISL	Trunk route type.
ESN	(NO) YES	ESN signaling.
BRIP	(NO) YES	ISDN BRI packet handler route.
ISDN	(NO) YES	ISDN PRI option.
- MODE	ISLD	Mode of D-Channel that controls the route.
- DCHI	1-15	DCHI port number Prompted if Mode = ISLD.
- PNI	0-32700	Customer Private ID (unique to a customer).
- IFC	aaa	Interface machine type for this PRI route.
- NCNA	YES	Network call name allowed.
- NCRD	YES	Network Call Redirection.
- TRO	(NO) YES	Trunk optimization allowed (denied) on the route.
- NSF	(NO) YES	Network Service Facility.
- TIER	xxx	Incoming Tie route number.

- CHTY	(BCH) ABCH	Signaling type for B-channel digital routes.
- CTYP	aaa	Call type for outgoing direct dialed Tie route.
- INAC	(NO) YES	Insert ESN access code to incoming private network call.
- NCOS	(0)-99	Network Call Of Service.
- CLS	aaa	Class of service restriction for tie route.
- TGAR	0-31	Trunk group access restrictions.
- IEC	000-999 000-319	Interexchange carrier ID. For Option 11C.
PTYP	aaa	Port type at far end.
ICOG	IAO ICT OGT	Incoming and Outgoing trunk. Incoming only trunk. Outgoing only trunk.
SIGO	aaa	Signaling arrangement.
NEDC	 ORG ETH	Near end disconnect control. Originating end control. Either end control.
FEDC	 (ORG) ETH FEC JNT	Far end disconnect control. Originating end control. Either end control. Far end control. Joint control.
CPDC	(NO) YES	Meridian 1 is the only controlling party on incoming calls.
DLTN	(NO) YES	Provide dial tone to the far-end.
PSEL	(DMDM) TLNK	T-link or DM-DM protocol selection.
EQAR	(NO) YES	Enable Equal Access on this route.
- GCR	(YES) NO	Use General Carrier Restriction for Equal Access calls.
- NTOL	(DENY) ALOW	Allow or deny North American toll calls (1+ calls).

- ITOL	(DENY) ALOW	Allow or deny international toll calls (011+ calls).
- SCR	(NO) YES	Use Selective Carrier Restriction for Equal Access calls.
AUTH	(NO) YES	Authcode to be prompted for incoming tie callers.

LD 14 – Assign a channel identification to each trunk with the ISL option.

Prompt	Response	Description
REQ	NEW	New.
TYPE	TIE	Trunk type allowed.
TN	l s c u	Terminal number.Use loop number created in LD17.
	c u	For Option 11C.
RTMB	0-511 1-510 0-127 1-510	Route number and member number, for Options 51C-81C. Route number and member number, for Option 11C.
CHID	1-382	Channel identifier for ISL channels (remove with Xnn)—must be coordinated with far end (no default value).

Feature operation

No specific operating procedures are required to use this feature.

Japan D70 nB+D

Contents

The following are the topics in this section:

Regional material statement 1159
Feature description 1159
Operating parameters 1160
Feature interactions 1160
Feature packaging 1160
Feature implementation 1161
Task summary list 1161
Feature operation 1163

Regional material statement

The information presented in this section does not pertain to all market regions. Contact your system supplier or your Nortel Networks representative to verify support of this product in your area.

Feature description

This feature provides nB+D ISDN Primary Rate connectivity between the Meridian 1 and the INS1500 D70 for Japan. The capability of a D-channel is expanded to support multiple PRIs (up to nine) in an nB+D configuration, where $1 \leq n \leq 215$. This enhancement allows for non-facility associated D-channels, so that a PRI might consist of 24 B-channels. The D-channel controlling these B-channels can be shared with another PRI link. The bit rate is 1.5 Mb.

The nB+D enhancement adheres to current trunk assignment limitations on the number of trunks that can be assigned to an individual trunk group.

Operating parameters

For the ISDN layer 1 interface, the circuit pack QPC720 (Digital Trunk Interface) is used for the Meridian 1 to D70 connectivity.

The QPC757E version of the D-channel Handler (DCH) circuit pack provides the Layer 2 functions and incoming Layer 3 preprocessing for the Meridian 1 to D70 connectivity.

The NTAK09AA (DTI/PRI) circuit pack is used for Option 11C systems, along with the NTAK93 D-channel Interface (DCHI) and NTAK20 Clock Controller.

A Multi-purpose Serial Data Link (MSDL) can be used in place of the DCH circuit pack (NT6D80AA).

Feature interactions

PRI Channel Negotiation

When a D-channel has one or more secondary PRIs associated with it while using the D70 interface, channel negotiation requires that the PRI interface be explicitly defined for all B-channels not on the primary interface.

Japan D70 Connectivity

Interface Identifiers are required on all PRIs, including the primary PRI. This interface is used in channel negotiation.

Feature packaging

The following packages are required for Japan D70 nB+D:

- Digit Display (DDSP) package 19 for Calling Line Identification on ISDN PRI;
- 1.5 Mb Digital Trunk Interface (PBXI) package 75;
- Integrated Services Digital Network (ISDN) package 145;
- Primary Rate Access (PRA) package 146;
- International Primary Rate Access (IPRA) package 202; and

- Multi-purpose Serial Data Link (MSDL) package 222 for use of the MSDL card in place of the DCH card.

All of the software packages required for Japan D70 ISDN PRI connectivity are used to configure Japan D70 ISDN nB+D PRI, with the following addition:

- International nB+D (INDB) package 255.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 17 – Configure nB+D for D70.

LD 17 – Configure nB+D for D70.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	CFN	Configuration Record.
- ADAN	NEW DCH x	Add a primary D-channel on logical port. x=0-63.
	NEW DCH 0-15	For Option 11C.
- CTYP	aaaa	Card type.
- GRP	0-4	Network group number for Option 81C.
- DNUM	0-15	Device number; physical port for D-channel.
...		
- USER	PRI	D-channel mode.
...		
- IFC	D70	Interface type for Japan D70.
...		

- - DCHL	0-159 1-126	PRI loop number and interface identifier for the DCHI when IFC =D70.
	1-9 1-126	For Option 11C.
...		
- PRI	0-159 1-126	Loop number and interface ID. Note that the interface ID range is larger when IFC=D70.
	<CR>	End definition of PRI loops.
	1-9 1-126	For Option 11C.
- OTBF	1-(32)-127	Number of output request buffers.
- DRAT	(56K) 64KC 64KI	D-channel transmission.
...		
- ADAN	NEW BDCH x	Add a primary D-channel on logical port x = 0-63.
	NEW BDCH x	For Option11C. x=1-15
...		
- PDCH	0-63	Primary D-channel.
...		
- CTYP	aaaa	Card type.
...		
- DNUM	0-15	Device number (physical port for the D-channel).
...		
- BCHL	0-159 1-126	PRI loop number and interface identifier for the DCHI when IFC=D70.
	1-9 1-126	For Option 11C.
...		

Feature operation

No specific operating procedures are required to use this feature.

Japan TTC Common Channel Signaling

Contents

The following are the topics in this section:

Regional material statement 1165
Feature description 1165
Operating parameters 1166
Feature interactions 1167
Feature packaging 1169
Feature implementation 1170
Task summary list 1170
Feature operation 1174

Regional material statement

The information presented in this section does not pertain to all market regions. Contact your system supplier or your Nortel Networks representative to verify support of this product in your area.

Feature description

The Japan Telecommunication Technology Committee (JTTC) Common Channel Signaling is the Japanese version of the International Standard Organization (ISO) ISDN QSIG. It specifies the Layer 3 protocol signaling requirement for support of circuit switched call control at the “Q” reference point between a Private Integrated Services Digital Network (PISN) and a Private Telecommunication Network (PTN).

The JTTC Common Channel Signaling feature provides basic call service on Meridian 1 ISDN 1.5 Mb PRI on TTC connectivity. It also supports other supplementary services.

This feature supports the following call services on the Meridian 1 JTTC interface:

- Basic Call Service
- 64K Clear Bearer capability
- Calling Line Identification Presentation/Calling Line Identification Restriction (CLIP/CLIR)
- Channel Negotiation
- Enbloc Dialing
- User to User Information Element Transparent Transport
- TIE call types
- Traveling Class Mark (TCM) Transparent Transport

Operating parameters

Basic Rate Interface (BRI) is not supported on the JTTC interface.

Connected Line Identification Presentation/Restriction (COLP/COLR) is not defined to JTTC standard.

Backup D Channel, nB+D, Overlap Signaling (Overlap sending/Overlap receiving), Party Category, and Transit Counter are not supported on the JTTC interface.

ISDN QSIG Generic Functional Transport, Network Automatic Call Distribution (NACD), Network Call Trace (NCT), and Remote Virtual Queueing (RVQ) are not supported on the JTTC interface.

Only circuit mode connection is supported on the JTTC interface.

MCDN/JTTC gateway supports only Basic Call and CLIP/CLIR.

For Option 11C, ISDN Signaling Link (ISL) is not supported on the JTTC interface.

The Japan TTC Common Channel Signaling feature requires the following hardware for Options 51C-81C:

- 1.5 Mb Primary Rate Access (PRA) card (QPC720F or higher) for layer 1 interface
- 2.0 Mb JDMI interface (Japan DTI2 QPC785 card) for ISDN Signaling Link (ISL) functionality
- Multi-purpose Serial Data Link (MSDL) card (NT6D80)
- Clock Controller (QPC775)

The Japan TTC Common Channel Signaling feature requires the following hardware for Option 11C:

- 1.5 Mb Primary Rate Interface (PRI)/Digital Trunk Interface (DTI) card (NTAK09)
- Downloadable D-Channel Daughterboard (NTBK51)
- Clock Controller (NTAK20)

Feature interactions

Networking Features

Some networking features currently exist on more than one ISDN interface on the Meridian 1 system. These features are listed in Table 82. The columns list the services and the rows list the interfaces.

Networking features that do not appear in Table 82 are only supported on one ISDN interface and are, therefore, rejected by all JTTC gateways when the service is requested. This is the case for all MCDN features that are not supported over the JTTC interface.

In Table 82 when a service is supported (Y), the information related to this service is accepted, decoded, and used according to the service description. When a service is not supported (N), the information related to this service is not sent to the interface. The request for the service is rejected according to the service rejection procedures. When a service is supported on two interfaces, a gateway function exists. This passes the information in order to support the service from one interface to the other.

Table 82
Networking features that exist on more than one ISDN interface implemented on Meridian 1

	JTTC	ETSI QSIG	ISO QSIG	Euro-ISDN	MCDN	ETSI BRI sets	Other BRI sets	Analog	D70
Calling Line ID/Calling Party Subaddress	Y	Y	Y	Y	Y	Y	Y	N	Y
Transit Counter	N	Y	N	N	Y	N	N	N	N
Call Charge	N	N	N	Y	N	N	N	Y	N

ISDN Signaling Link

The existing Integrated Signaling Link (ISL) operation is supported on the JTTC interface on the JDMI 2 Mb interface only.

Only the first 23 TIE trunks of the JDMI loop are configurable for ISL operation.

Network Attendant Service

JTTC interacts with Network Attendant Service (NAS) as though the call is being sent to a route without NAS being equipped.

Network Call Redirection

The existing Network Call Redirection limitation on unsupported interfaces applies to the JTTC interface.

When a call is terminated on the Meridian 1 and Network Call Redirection is active, Japan TTC Common Channel Signaling can still operate. However, the original called number and the redirection number IEs that are used by the Network Call Redirection feature are not sent on the JTTC interface.

Network Calling Party Name Display

The Network Calling Party Name Display (NCPND) feature is supported within an MCDN network only. When the JTTC interface is involved in the call setup, the existing NCPND operation on unsupported interfaces applies to the JTTC interface also.

Network Message Service

Network Message Service (NMS) is supported within an MCDN network only. The NMS operation on the JTTC interface is the same as that of the existing treatment for unsupported interfaces.

Network Ring Again

Network Ring Again (NRAG) signaling is supported within a Meridian Customer Defined Network (MCDN) only. When a user requests NRAG on the JTTC interface, the request is rejected.

Trunk Route Optimization

Trunk Route Optimization (TRO) is supported within an MCDN network only. When a redirecting node sends a message to the originating node and the TRO request is accepted, the new call goes through the JTTC interface as a normal basic call. However, TRO signaling does not operate on the JTTC interface.

Virtual Network Services (VNS)

A JTTC link can be used as a B-Channel for Virtual Network Service (VNS) over a private network. All VNS services are supported normally. JTTC is used only as a speech bearer.

Feature packaging

Japan TTC Common Channel Signaling is Japan TTC (JTTC) package 335. The following packages are also required for JTTC:

- Japan Digital Multiplex Interface (JDMI) package 136 for ISL functionality

- Integrated Services Digital Network (ISDN) package 145
- Primary Rate Access (PRA) package 146
- International Primary Rate Access (IPRA) package 202
- Multi-purpose Serial Data Link (MSDL) package 222

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 73 – Define a new Digital Data Block (DDB) with a defined threshold.

2 LD 17 – Configure a digital loop number for Japan TTC.

3 LD 17 – Configure a new D Channel with Japan TTC Common Channel Signaling interface.

4 LD 16 – Configure Japan TTC interface.

5 LD 14 – Configure trunks for Japan TTC.

LD 73 – Define a new Digital Data Block (DDB) with a defined threshold.

Prompt	Response	Description
REQ	NEW	Add new data.
TYPE	DDB	Digital Data Block.
CLKN	1-9	Card number for Clock Controller (Option 11C).
- PREF	 0-159 1-9	Primary Reference Source loop for Clock Controller. Source card for Clock Controller (Option 11C). Enter the PRI loop number or card number (Option 11C) that is defined at the DLOP prompt in LD 17. This prompt must be defined for the SLAV Meridian 1 only.

- - SREF		Secondary Reference (prompted only when PREF is not free-run).
	0-159	Source loop for Clock Controller.
	1-9	Source card for Clock Controller (Option 11C). This prompt must be defined for the SLAV Meridian 1 only.
TRSH	0-15	Threshold set.

LD 17 – Configure a digital loop number for Japan TTC.

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	CEQU	Common Equipment parameters.
...		
- DLOP		Digital Trunk Interface Loop, where:
	loop	Loop number (0 - 159)
	dd	Number of voice or data calls (0 - 24)
	ff	Frame format D2, D3, D4, or ESF.
		For Option 11C.
	c	DTI/PRI card number (1-9)
	dd	Number of voice or data calls (0-24)
	ff	Frame format D2, D3, D4, or ESF.
- MODE	PRI	Primary Rate Interface mode.
- - TRSH	xx	Digital Trunk Interface threshold. The TRSH value must match the value defined in LD 73.

LD 17 – Configure a new D Channel with Japan TTC Common Channel Signaling interface.

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	ADAN	Action Device and Number.
ADAN	NEW DCH x	Create a new D-channel. x = 0 - 63 x = 0-15 (For Option 11C)

- CTYP	MSDL	Multi-purpose Serial Data Link card type. The MSDL card is the only card type that supports Japan TTC. ***Note:*** The MSDL card cannot be used for Option 11C. For Option 11C, however, MSDL must be entered at the CTYP prompt for Downloadable D-Channel.
- GRP	0-4	Network Group number (Option 81C). Group numbers cannot be changed until the I/O devices associated with that group are disabled.
- DNUM	xx	Device number. All ports on the MSDL card share the same DNUM.
- PORT	0-3	Port number on the MSDL card.
- USR	 PRI ISLD	D Channel mode. Primary Rate Interface. Integrated Services Digital Link Dedicated.
- IFC	JTTC	Interface ID for Japan TTC.
- -ISDN_MCNT	60-(300)-350	Layer 3 call control message count per 5 second time interval.
- - ISLM	1-382	Integrated Services Signaling Link Maximum.
- -DCHL	x	PRI loop number for D-channel, as defined in LD 17 at the DLOP prompt.
...		
- BPS	xxxxx	Asynchronous baud rates (bits per second), where xxxxx is: 1200, 2400, 4800, 9600, 19200, 48000, 56000, 64000.
- SIDE	 (USR) NET	Meridian 1 node type. Slave to the controller. Network, the controlling switch.
- RLS	23	Release ID of the switch at the far-end of the D-channel.

LD 16 – Configure Japan TTC interface.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	RDB	Route Data Block.
CUST	xx	Customer number.
ROUT	0 - 511 0-127	Route Number. For Option 11C.
TKTP	TIE	TIE trunk type. Used for PBX-to-PBX interface.
DTRK	YES	Digital trunk route.
- DGTP	PRI	Digital trunk type.
ISDN	YES	Integrated Services Digital Network.
- MODE	 PRA ISLD	Mode of operation. D-channel mode is Primary Rate Interface. D-channel mode is Integrated Services Digital Link Dedicated.
- DCH	0-159	D channel number, as defined in LD 17.
...		
- IFC	JTTC	Interface for Japan TTC.
- - PNI	(0)-32700	Private Network Identifier. Must match far end PBX.

LD 14 – Configure trunks for Japan TTC.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	TIE	TIE trunk data block.
TN	l ch c u	Loop and channel for digital trunk. For Option 11C.
CUST	xx	Customer number, as defined in LD 15.
SICA	(1)-16	Signaling category table number. The default is 16 if the loop type = JDMI.
RTMB	0-511 1-254 0-127 1-254	Route number and member number. For Option 11C. The Route number is specified in LD 16.
TGAR	0 - (1) - 31	Trunk Group Access Restriction. The default value (1) automatically blocks direct access.

Feature operation

No specific operating procedures are required to use this feature.

Malicious Call Trace Enhancements

Contents

The following are the topics in this section:

Feature description 1175
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Reference list

The following are the references in this section:

Features and Services (553-3001-306)

Feature description

Malicious Call Trace (MCT) allows users of selected telephones to activate a call trace that results in a printed report of the calling and called parties. The report is generated on all system TTYs designated as maintenance (MTC) terminals.

The Malicious Call Trace feature has been enhanced to offer advanced capabilities across an ISDN PRI network, as explained in the following sections. For a description of the basic Malicious Call Trace feature, refer to *Features and Services* (553-3001-306).

Functional enhancements

The following enhancements add to the functionality of the basic Malicious Call Trace feature:

- For a call (from or to a Central Office on an analog CO or DID trunk), a special signal (hook flash and optional DTMF digit string) is sent to the Central Office if the option is configured.
- Alarm operation is maintained; however, the duration of the alarm is now flexible (0-15 minutes), instead of being fixed at 15 minutes.
- The malicious call can be recorded using a recording trunk, if provisioned.
- The call trace record can now be printed on any Serial Data Interface (SDI) port with MCT defined as a user.
- The flexible firmware flash can be transmitted on the EXUT and XFCOT cards. This functionality is used by the Enhanced Malicious Call Trace, Meridian 911, and Autodial Tandem Transfer features.
- The MCT feature can be activated from a Meridian 1 set during the established state of the call or during call clearing when interfaced with AXE10 Australia on 2 Mb PRI trunks.

MCT record

The following enhancements to the Malicious Call Trace record have been introduced:

- Prior to enhancement, during an established call, the user of a set having Malicious Call Trace (MCT) Allowed Class of Service could invoke a call trace against the call. Activation of the feature resulted in the printing of a call trace record on the maintenance teletype terminal (TTY) of the system. The Malicious Call Trace record did not contain any identifier of whether the call was external or internal; the format of these records is changed to provide information about the type of call (internal or external).

Malicious Call Trace for Saudi Arabia

In Saudi Arabia, from a user's perspective, the Malicious Call Trace feature activation remains the same as it was prior to this enhancement. However, with this enhancement, the feature is now available for different types of analog and digital (CO, DID, and DOD) trunks. In order to send the MCT request, a special digit string is transmitted to the CO for an analog or digital trunk interface.

Malicious Call Trace for AXE-10 Australia

In Australia, MCT can be activated during the established state of the call when interfaced with AXE-10 Australia on 2.0 Mb Primary Rate Interface (PRI) trunks. MCT can also be activated during the call clearing state of the call (within a maximum of 30 seconds from the caller going on hook).When MCT is activated, a special FACILITY message, with a keypad information element, is transmitted to the CO.

Trace Number (TRC) Key Lamp Status

The TRC key lamp status indicates the progress and success of the Malicious Call Trace request signaling to the CO and the availability of the recorder. The following are the lamp states:

Lamp Winking

Activation of the TRC key changes its lamp from dark to winking if the trunk involved in the call requires the signaling to be done. The lamp remains winking, indicating a transient state, until the call trace request signaling to the CO has been completed.

In a Meridian Customer Defined Network (MCDN) tandem scenario, the set which originated the call trace remains winking until a Facility message is received from the node nearest to the Central Office. The user cannot invoke MCT again while the lamp is in the winking state.

Lamp Lit

If the call trace request to the CO is successful and the recorder is conferenced in the call, the lamp state is changed to lit.

In an MCDN tandem scenario, the lamp goes from winking to lit if a Facility message received from the node nearest to the CO indicates that the MCT request was successful. Activation of the TRC key during this state is ignored.

Lamp Flashing

This lamp state indicates that the call trace request to the CO was transmitted successfully, but a recorder could not be conferenced in. Activation of the TRC key during this state re-generates the MCT record, activates the alarm, and again attempts to conference in the recorder. The call trace request signaling to the Central Office is not transmitted again.

Lamp Dark

This lamp state indicates an idle TRC key or failure of the call trace request to the CO.

In an MCDN tandem scenario, the lamp goes from winking to dark if a Facility message received from the node nearest the CO indicates that the MCT request was unsuccessful.

Activation of the TRC during this state initiates all call trace elements again, including: transmission of trunk hook flash, conferencing a recorder (if one is not already hooked in), generating an MCT record, and activating an alarm.

Operating parameters

Any country using flexible firmware flash timing (60-1536 msec.) requires the Generic XFCOT cards NTCK16AE or NTCK16BE; or the EXUT card NT8D14BA. For any country not using either the Generic XFCOT card or the EXUT card, the same functionality is provided by software control.

Downloadable D-channel for the Option 11C must be used to support MCT for AXE-10 Australia (2 Mb PRI).

The following hardware is required to activate this feature on Options 51C, 61C, and 81C machine types: Analog CO/FX/WATS QPC 525A; DID trunk QPC449B LP TRK, QPC825; 2.0 Mb DTI interface QPC 536 B; PRI2 interface NT8D72BA; Digitone Receiver QPC574A, NT8D16AB; TDS QPC609D, NTAK03AA; Recorded telephone trunk QPC71; Conference card QPC444A; and MSDL card NT6D80AA.

The following hardware is required for the Option 11C: XUT NT8D14A; TDS/DTR NTAK03AA; CPU/CONF NAK01AA; 2.0 Mb PRI NTAK79AA; DCH loadware NTBK50, NTBK51; 1.5 Mb DTI NTAK09AA; 2.0 Mb DTI NTAK10AA; Recorded telephone trunk NT8D14; and XFCOT card NTCK16AE, NTCK16BE; and EXUT card NT8D14BA.

Feature interactions

For Feature interactions pertaining to the basic Malicious Call Trace feature, refer to *Features and Services* (553-3001-306).

Malicious Call Trace Enhancements

ACD Emergency Key (EMR)

The Malicious Call Trace feature operates in a similar manner to the ACD Emergency key feature when conferencing a recording. In this enhancement, the ACD set can activate both the Malicious Call Trace and ACD EMR features.

Autodial Tandem Transfer

The Trunk Hook Flash functionality is used by Autodial Tandem Transfer and Enhanced Malicious Call Trace.

Centrex Switchhook Flash

Interaction with the Centrex Switchhook Flash results because the flash range is changed for this feature. Communication to the CO (trunk hook flash) is performed by using the Centrex Switchhook Flash feature base code. The enhanced range is available for the Centrex Switchhook Flash.

Called Party Control (CDPC) Option

Prior to this feature, the CDPC option was not supported for conference calls. This has changed; the CDPC option is now supported if the conference contains exactly one recording trunk, one MCT activating party, and one other trunk. This is done to make the recorder transparent to the user. The CDPC option remains unsupported for all other conference calls.

Malicious Call Trace Idle Signal

The existing operation of the Malicious Call Trace Idle Signal feature is unchanged.

MCT DN/TN Print

If the option MCDC (in LD 15) is set, a second line is added in the MCT reports to show the DN of both parties of the call. If CLID is available it is printed in the second line.

M911

The Trunk Hook Flash functionality is used by M911 and Enhanced Malicious Call Trace.

Feature packaging

Enhanced Malicious Call Trace is packaged under the existing Malicious Call Trace (MCT) package 107.

For ISDN environments, ISDN packages are required based on the node and network interface applicable to the specific country. In addition, International Supplementary ISDN Features (ISDN INTL SUPP) package 161 is required.

In order to send an MCT message request to a tandem node, Network Attendant Service (NAS) package 159 must be equipped.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 10 – Activate Malicious Call Trace from an analog (500/2500 type) telephone.

2 LD 11 – Activate Malicious Call Trace from a Meridian 1 proprietary telephone.

3 LD 17 – In order to print the MCT record on a dedicated MCT TTY port, USER type MCT must be defined.

4 LD 16 – Setup the recorder route.

5 LD 14 – Setup the recorder trunk.

6 LD 15 – Setup the recorder and alarm options.

7 LD 16 – Set up the alarm for external calls.

8 LD 57 – In order to activate malicious call trace from the analog (500/2500 type) set without using the SPRE and 83, the MCT FFC must be defined.

9 LD 16 – For analog and 2.0 Mb digital trunks, the flash range to be sent to the Central Office is configured using the FLH timer. In order to send the string to the Central Office, MCCD must be defined.

10 LD 14 – The WTM prompt is provided for EXUT and XCOT cards. This prompt should be set to YES if firmware timing is to be done for the flash and the card supports this functionality. If the prompt is set to YES for one unit, it is also set to YES for all other units.

11 LD 73 – Define the DTI2 flash time range.

12 LD 16 – Setup MCTM timer and tandem delay (2 Mb PRI for AXE-10 Australia only).

LD 10 – Activate Malicious Call Trace from an analog (500/2500 type) telephone.

To activate Malicious Call Trace from an Analog (500/2500 Type) telephone dial SPRE + two-digit access code (83) or the MCT FFC.

Prompt	Response	Description
REQ:	NEW CHG	New, or change.
TYPE:	500	Set type.
TN	l s c u	Terminal Number.
	c u	For Option 11C.
CLS	(MCTD) MCTA	Malicious Call Trace is allowed if class is MCTA.

LD 11 – Activate Malicious Call Trace from a Meridian 1 proprietary telephone.

To activate Malicious call Trace from a Meridian 1 proprietary telephone, CLS MCTA TRC KEY should be defined. However, the same function can be achieved using a transfer or conference key and the SPRE + 83 or the MCT FFC.

Prompt	Response	Description
REQ:	NEW CHG	New, or change.
TYPE:	aaaa	Set type.
TN	l s c u	Terminal Number.

	c u	For Option 11C.
CLS	(MCTD) MCTA	Malicious Call Trace is allowed if class is MCTA.

LD 17 – In order to print the MCT record on a dedicated MCT TTY port, USER type MCT must be defined.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	CFN	Type of data block.
ADAN	xxx TTY yy	xxx = new or change. yy = port number 0-63 or 0-15.
USR	MCT	Dedicated TTY port for MCT record.

LD 16 – Setup the recorder route.

Prompt	Response	Description
REQ	NEW CHG	New, or change.
TYPE	RDB	Route Data Block.
ROUT	xxx	Route number.
TKTP	RCD	Recorder trunk data block.
ACOD	xxxx	Recorder route access code.

LD 14 – Setup the recorder trunk.

Prompt	Response	Description
REQ	NEW CHG	New, or change.
TYPE	RCD	Recorder trunk.

TN	l s c u	Terminal Number.
	c u	For Option 11C.
CUST	xx	Customer number.
RTMB	xxx xxx	Trunk route and member number for RCD.

LD 15 – Setup the recorder and alarm options.

Prompt	**Response**	**Description**
REQ:	CHG	Change.
TYPE:	FTR	Features and options data.
CUST	xx	Customer number.
...		
- ALDN	xxxxxxx	DN for the alarm.
- ALRM	(NO) YES	The ALRM prompt appears only if ALDN is defined. ALRM has to be set to YES if the alarm is to be rung for any call (external or internal) when MCT is activated.
- TIME	0-(15)	Time is prompted only if ALRM is set to YES. Time for the alarm is set in one-minute increments from 1 to 15.
- INT	(NO) YES	INT is prompted only if ALRM is set to YES. In addition, INT must be YES if the alarm is to be rung when MCT is activated against internal calls.
- RECD	(NO) YES	If the user wants the recorder, set RECD to YES. This prompt does not appear when a new customer is being defined.
- - MCRT	xx	The user has to use the recorder route number defined in LD 16. It will only be prompted if the RECD is set to YES.

LD 16 – Set up the alarm for external calls.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	RDB	Route Data Block.
TKTP	DID COT	Direct Inward Dialing Trunk. Central Office Trunk.
ALRM	(NO) YES	Malicious Call Trace is allowed for external calls when the response is YES.

LD 57 – In order to activate malicious call trace from the analog (500/2500 type) set without using the SPRE and 83, the MCT FFC must be defined.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	FFC	Flexible Feature Code.
CUST	xx	Customer number.
CODE	MTRC	Malicious Call Trace.
- MTRC	xxxx	Flexible Feature Code for Malicious Call Trace.

LD 16 – For analog and 2.0 Mb digital trunks, the flash range to be sent to the Central Office is configured using the FLH timer. In order to send the string to the Central Office, MCCD must be defined.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	RDB	Route Data Block.
RCLS	(EXT) INT	Class marked route as (external) or internal.
...		
CNTL	YES	Changes control or timers.
- TIMR	FLH <space> 60-(510)-1536	Flash timer in msec. The range of the Centrex switch hook flash timer is 60-(510)-1536. The FLH value is rounded down to the nearest 10 msec. tick. If the value entered is 128 or 129, then it is set to 130 msec. *Software controlled flash* 60-127 msec. Digit 1 will be sent. (Not applicable to XFCOT card. It is applicable to XUT card.) 128-1536 msec. software controlled switch hook flash. (Applicable to both XUT and XFCOT cards.) *Firmware controlled flash* The user can enter any value from 60 to 1536 msec. 90 msec. is the hardcoded firmware flash for an XFCOT pack; the craftsperson should enter 90 msec. ***Note:*** the FWTM prompt must be set to YES for the trunk associated with this route in LD 14, if firmware timing is to be used.
...		
MCTS	(NO) YES	Enter YES to get the new prompts
- MCCD	0-8 digits	The call trace request string can be 0-8 digits in length. Valid digits are 0-9, *, and #.
- MCDT	(0)-4	Digit string delay is in seconds, in increments of one second.

LD 14 – The WTM prompt is provided for EXUT and XCOT cards. This prompt should be set to YES if firmware timing is to be done for the flash and the card supports this functionality. If the prompt is set to YES for one unit, it is also set to YES for all other units.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	DID COT	Direct Inward Dialing Trunk. Central Office Trunk.
TN	l s c u c u	Terminal Number. For Option 11C.
XTRK	EXUT XCOT	Enhanced Extended Universal Trunk. Extended Central Office trunk card.
FWTM	(NO) YES	Firmware timing for the trunk hook flash is available. This prompt is set to YES if firmware timing for trunk hook flash is supported by the pack.
CUST	xx	Customer number.
RTMB	xxx yyy	Trunk route. Member number for RCD.

LD 73 – Define the DTI2 flash time range.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	DTI2	2.0 Mb Digital Trunk Interface
FEAT	abcd	Digital signaling category.
SICA	2-16	SICA table number.
...		
FALT (R)	abcd N	Fault (DTI out-of-service). If Fault is not required.
P RRC (S)	abcd	Register recall signal activated by MCT.

TIME	10-(100)-630	Time of RRC(S) signal in milliseconds. This is the flash duration used for 2.0 Mb DTI trunks. It is programmable in one-millisecond increments from 10 to 630.

LD 16 – Setup MCTM timer and tandem delay (2 Mb PRI for AXE-10 Australia only).

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	RDB	Route Data Block.
CUST	xx	Customer number.
MCTS	(NO) YES	Malicious Call Trace Signal.
- MCTM	(0) - 30	Malicious call trace timer (in seconds).
- MTND	(NO) YES	Malicious Call Trace disconnect delay for tandem calls for AXE10 Australia.

Feature operation

There are no operating procedures specified for this feature.

MCDN Alternate Routing

Contents

The following are the topics in this section:

Feature description 1189
Originating node operation 1191
Transit node operation 1193
MCDN Alternate Routing examples 1195
Operating parameters 1198
Feature interactions 1199
Feature packaging 1200
Feature implementation 1201
Task summary list 1201
Feature operation 1202

Feature description

The MCDN (Meridian Customer Defined Network) Alternate Routing feature provides a solution to calls encountering congestion due to high traffic situations within an MCDN network. The MCDN Alternate Routing feature is supported over an MCDN-based ISDN protocol.

The MCDN Alternate Routing feature uses the routing capability of Network Alternate Route Selection (NARS) to re-route a congested call. For each MCDN call translated at a Meridian 1 node, NARS selects one route from up to 512 routes to complete the call. These routes are programmed in a route list. Each route in the list is called an entry. There may be up to 64 entries in each route list. Any combination of trunks can be specified in a route list.

The MCDN Alternate Routing feature may be configured for each of the 512 different routes.

Congestion occurs when channels within the network are not available. With the introduction of the MCDN Alternate Routing feature, each entry of a route list on one node can be configured to take an alternate entry (route) from the route list of that node (Private Exchange or Central Office), if congestion is encountered.

Alternate routing configuration takes place in LD 86, the Electronic Switched Network (ESN) administration overlay. The option defined for the Step Back On Congestion (SBOC) prompt determines the type of alternate routing available to calls over a particular route.

Alternate routing options are:

- NRR: no alternate routing is performed. The call receives congestion treatment.
- RRO: re-route at the originating node if a call encounters congestion. If congestion is encountered at a transit node, the call drops back to the preceding node, so that the preceding node decides if re-routing is required.
- RRA: re-route the call at any node, whether originating or transit node, when congestion is encountered.

The MCDN Alternate Routing feature is triggered at the controlling node when a Call Clearing message (DISCONNECT or RELEASE COMPLETE) is received, and the cause value in the Call Clearing message is supported for the MCDN Alternate Routing feature. The cause values which activate the MCDN Alternate Routing feature are:

- Cause 3 = No route to destination
- Cause 27 = Destination is out of service
- Cause 34 = No channel/circuit available
- Cause 38 = Network out of order
- Cause 41 = Temporary failure
- Cause 42 = Congestion

Note: To ensure that MCDN Alternate Routing occurs for all nodes in a system, define all nodes as SBOC = RRA. Conversely, to prevent MCDN Alternate Routing from occurring on any nodes, define all nodes as SBOC = NRR.

Refer to "Originating node operation" on page 1191, "Transit node operation" on page 1193, and "MCDN Alternate Routing examples" on page 1195 for more information on MCDN Alternate Routing operation for each SBOC prompt.

Note: If any of the cause values listed below are received in a Call Clearing message, the non-MCDN Alternate Routing retry operation occurs. That is, an attempt is made to retry the call. The retry first attempts to find another idle channel in the same route. If all the channels in that route are busy, it attempts to find another channel in the next alternate route in the Route List Block.

- Cause 6 = Channel unacceptable
- Cause 44 = Requested circuit/channel not available
- Cause 82 = Identified channel does not exist

Refer to Figure 94, Originating node operation. If Node C sends one of the non-MCDN Alternate Routing cause values, the Call Clearing message is sent back to Node A which attempts non-MCDN Alternate Routing.

Refer to Figure 95, Transit node operation. If Node C receives one of the non-MCDN Alternate Routing cause values:

- Node C attempts to find an alternate route but none is available.
- Node B is a transit note and does not attempt to find an alternate route.
- Node A attempts to find an alternate route but none is available.

Originating node operation

Consider the following calling scenario for an originating node operation. An attempt is being made to establish a call over an MCDN link, from originating node A to terminating node D, through transit nodes B and C. Congestion occurs between nodes C and D.

Whether node C is defined as SBOC = RRA or RRO or NRR, the congestion message, along with a MCDN Alternate Routing feature cause value, is always sent back to node B.

At node B, the SBOC option is checked to determine the routing treatment:

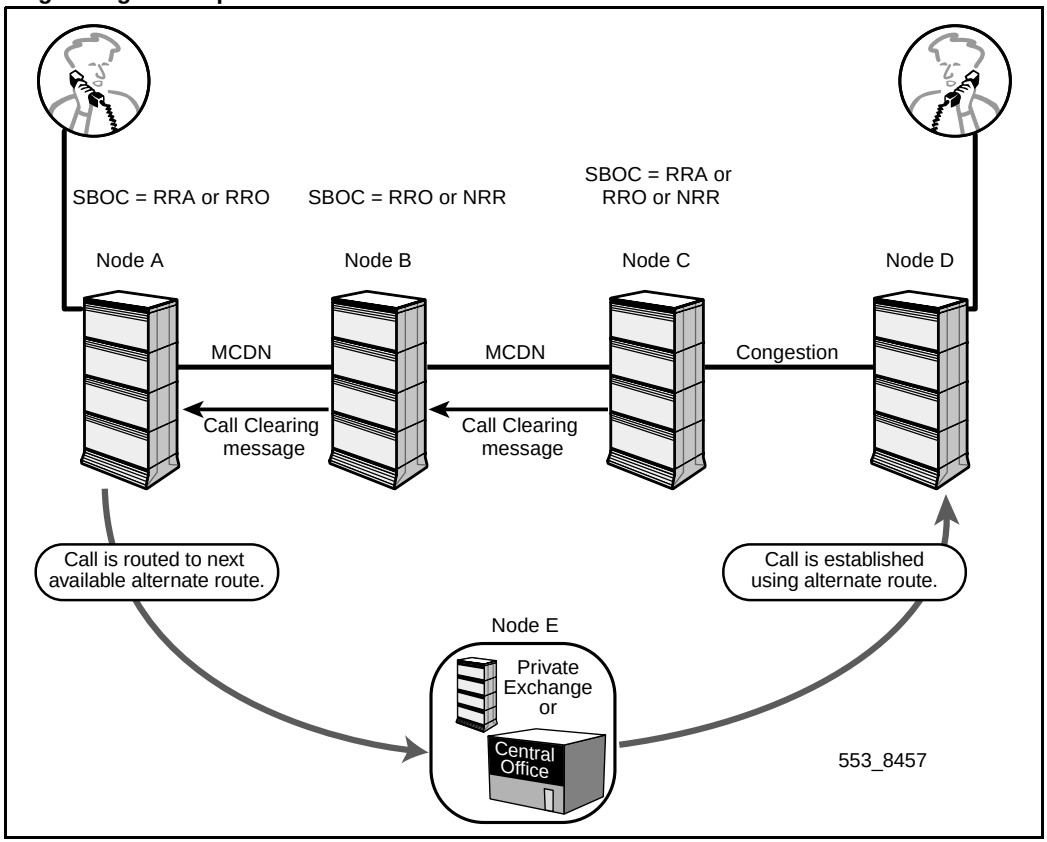
- If **node B is defined as SBOC = NRR**, the Call Clearing message is sent back to the preceding node, A.
- If **node B is defined as SBOC = RRO**, the Call Clearing message is sent back to node A because A is the originating node.
- If **node B is defined as SBOC = RRA**, an attempt is made to find an available alternate route until all of the alternate routes, as defined in the Route List (the RLB prompt in LD 86) are tried. If no alternate route is available, the congestion message information is sent from node B to the preceding node A.

In the originating node operation, node A must be defined as SBOC = RRA or RRO to perform MCDN alternate routing from node A to E to D.

Figure 94 illustrates an originating node operation. With congestion between nodes C and D, the Call Clearing message is sent from node C to B. Because node B is defined as SBOC = RRO or NRR, the Call Clearing message is sent back to node A. With node A defined as RRA or RRO, an attempt is made to find an available alternate route.

The first available alternate route is found between nodes A and E. Node E can either be a Private Exchange or Central Office. The Network Class of Service access checks are passed, the direct leg between the congested node, C, is released, and an alternate route is created from node A through node E. The call is then rerouted from nodes A and E to the terminating node, D.

Figure 94
Originating node operation



Transit node operation

Consider the following calling scenario for a transit node operation. An attempt is being made to establish a call over an MCDN link, from originating node A to terminating node D, through transit nodes B and C. Congestion occurs between nodes C and D.

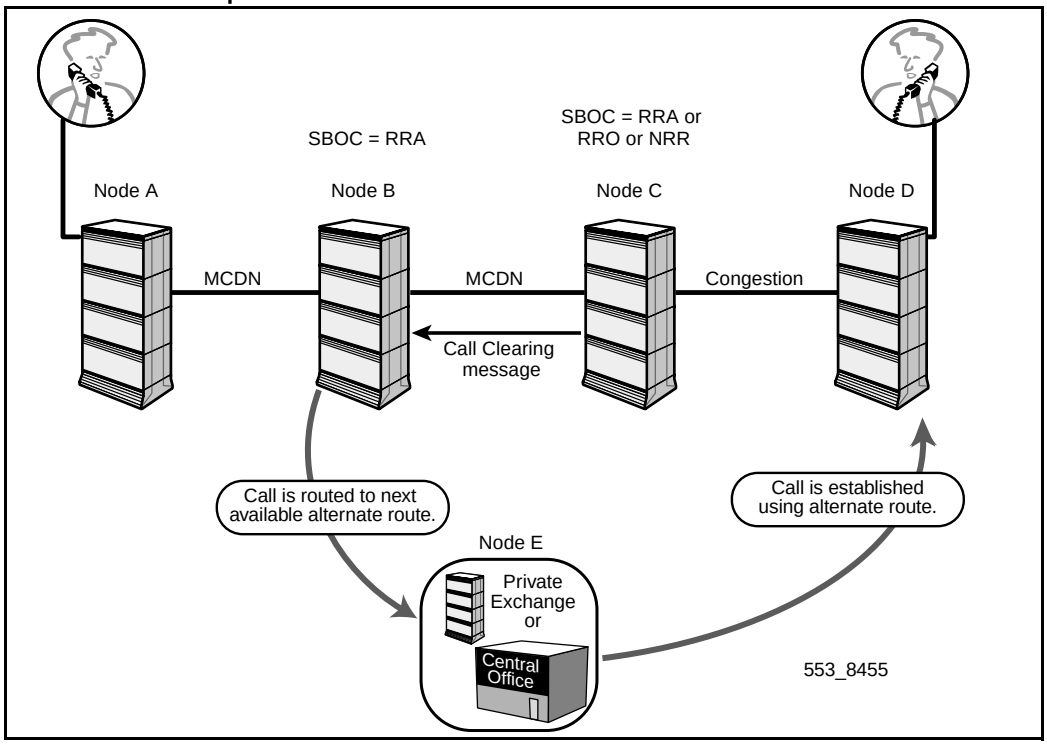
Whether node C is defined as SBOC = RRA or RRO or NRR, the congestion message, along with a MCDN Alternate Routing feature cause value, is always sent back to node B.

At node B, the SBOC option is checked to determine the routing treatment:

- If **node B is defined as SBOC = NRR**, no rerouting occurs; the Call Clearing message is sent back to the preceding node, A.
- If **node B is defined as SBOC = RRO**, the Call Clearing message is sent back to the preceding node, A, because node B is not the originating node.
- If **node B is defined as SBOC = RRA**, an attempt is made to find an available alternate route until all of the alternate routes, as defined by Route List (the RLB prompt in LD 86) are tried.

Figure 95 illustrates a transit node operation with node B defined as SBOC = RRA. The first available alternate route is found between nodes B and E. Node E can either be a Private Exchange or Central Office. The Network Class of Service access checks are passed, the direct leg between the congested node (node D) is released, and an alternate route is created from node B through node E to the terminating node, D.

Figure 95
Transit node RRA operation

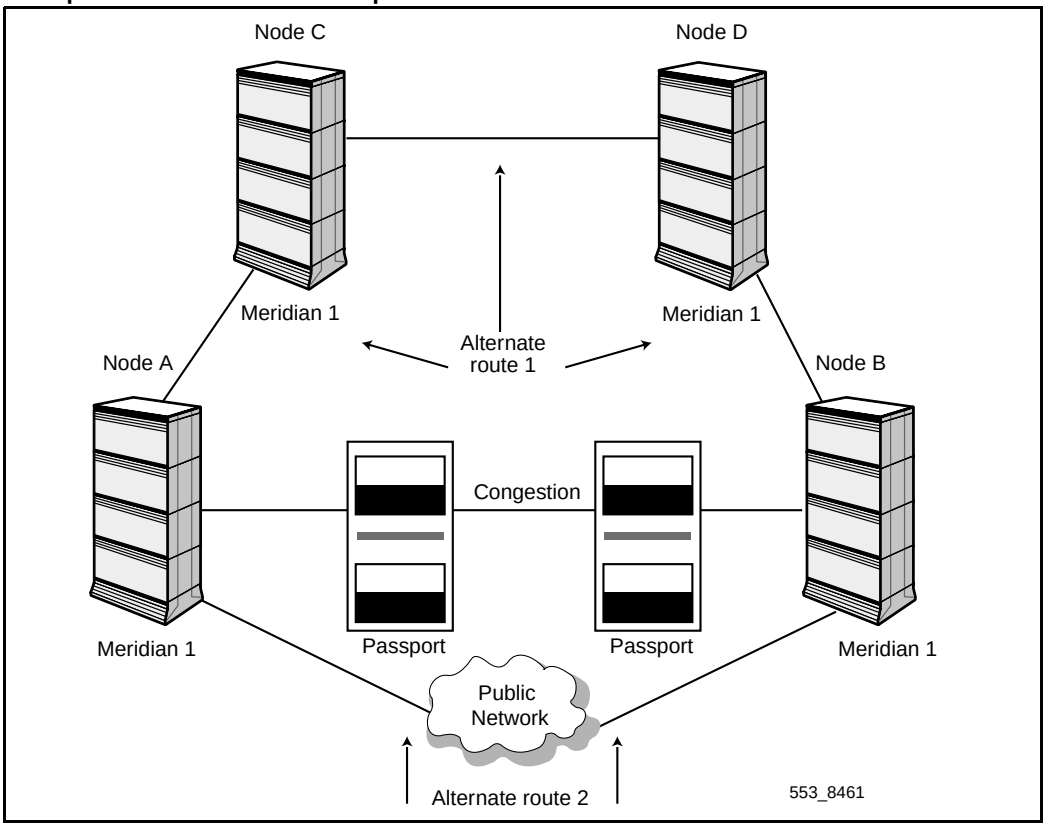


MCDN Alternate Routing examples

Example 1: Meridian 1 networked with Passport

In this scenario (refer to Figure 96), node A attempts to call node B using a primary route through Passport. The primary route is congested. Passport sends the cause value in the Call Clearing message to node A. With node A defined as SBOC = RRA or RRO, the cause value triggers a retry to make the call through the next alternate route. Alternate route 1 is from node A to node B through nodes C and D. If alternate route 1 is unavailable, then an attempt is made to route the call through alternate route 2: node A to node B through the Public Network.

Figure 96
Example of Meridian 1 with Passport network



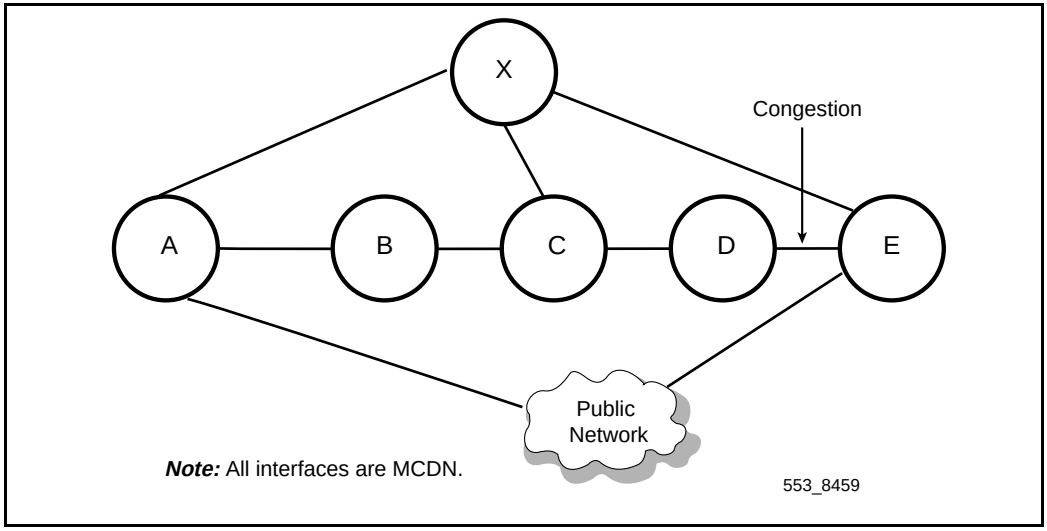
Example 2: Multi node network

Consider a scenario (refer to Figure 97) where a call is made from node A to node E through nodes B, C, and D. If there is congestion between nodes D and E, the Call Clearing message is sent from node D to node C:

- If node C is defined as SBOC = RRA, an attempt is made to find an alternate route. An alternate route is found from node C through node X to node E.

- If node C is defined as SBOC = RRO or NRR, the Call Clearing message is sent back to node B. Whether node B is defined as SBOC = NRR or RRO or RRA, the Call Clearing message is sent back to node A. Whether node A is defined as SBOC = RRA or SBOC = RRO, an attempt is made to find an alternate route. Alternate routes in this case are either from node A through node X to node E or from node A to node E through the Public Network.

Figure 97
Example of multi node network



Example 3: Tandem call with non-ISDN originating node

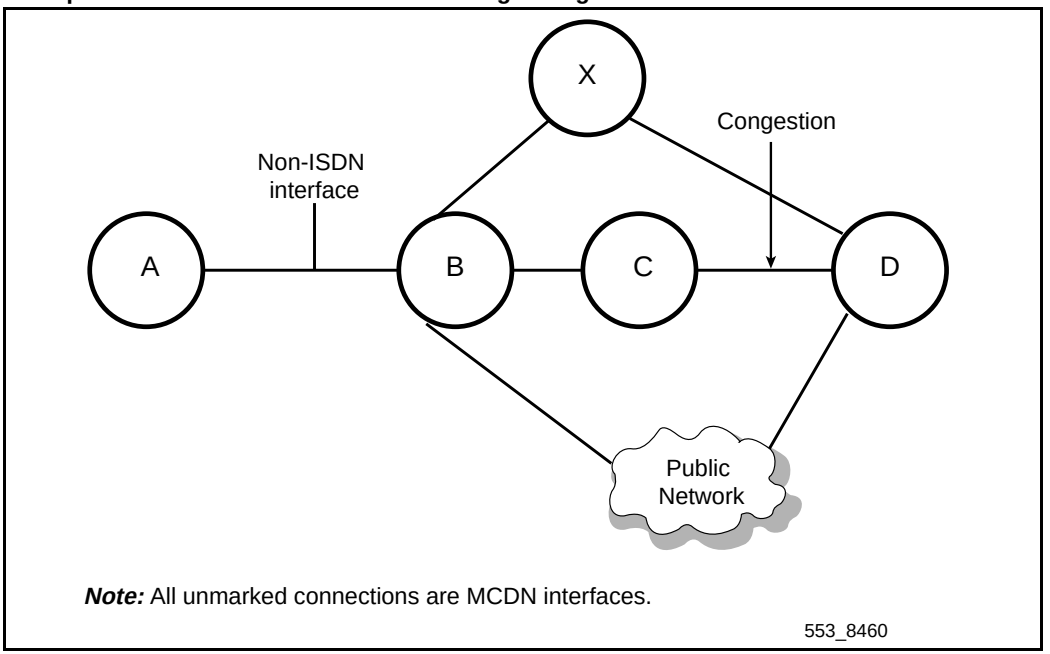
This scenario (refer to Figure 98) shows a tandem call with a non-ISDN originating node.When a call is made from node A to node D, the call is routed through nodes B and C. Congestion is encountered between nodes C and D.

Whether node C is defined as SBOC = RRA or RRO or NRR, the Call Clearing message is always sent back to node B.

- If node B is defined as SBOC = RRA, an attempt is made to find an alternate route. The alternate route through node X or through the Public Network to terminating node D is used to route the call.

- If node B is defined as SBOC = RRO or NRR, no alternate routing is attempted because the link between nodes B and A is non-ISDN. The call is cleared according to non-MCDN Alternate Routing operations.

Figure 98
Example of a tandem call with non-ISDN originating node



Operating parameters

Route Access codes are not supported for MCDN Alternate Routing. The Coordinated Dialing Plan (CDP) or the Uniform Dialing Plan (UDP) is required for MCDN Alternate Routing, but not both. If UDP is used, Network Alternate Route Selection (NARS) or Basic Alternate Route Selection (BARS) must be provisioned.

The MCDN Alternate Routing feature does not support MCDN ISDN BRI trunks.

Feature interactions

Automatic Least Cost Routing

When a Call Clearing message is received, the MCDN Alternate Routing feature attempts a retry through the next alternative route, whether the alternative route is an Initial Set (ISET) or an Extend Set (ESET) route.

Drop Back Busy

If both the MCDN Alternate Routing feature and Drop Back Busy feature are configured in the same MCDN network, the MCDN Alternate Routing feature takes precedence.

Expensive Route Warning Tone

The Expensive Route Warning Tone is provided at the originating node when the MCDN Alternate Routing attempts to re-route the call through an expensive route. The Expensive Route Warning Tone is **not** provided when re-route to an expensive route occurs at a transit node.

Intercept treatment

The intercept treatment for network blocking is not applied at the transit node if the MCDN Alternate Routing feature is active at the transit node. The call is dropped back with the appropriate congestion IE information.

If the MCDN Alternate Routing feature fails to find an alternate route for a call encountering congestion at a transit node, intercept treatment is not applied at the transit node. The call is dropped back to the originating node with the appropriate congestion IE information.

Integrated Services Access

The MCDN Alternate Routing feature is supported for MCDN Integrated Services Access (ISA) routes.

ISDN Signaling Link

The MCDN Alternate Routing feature is supported for MCDN D-Channel ISDN Signaling Link (ISL) routes.

Network Attendant Service

The Network Attendant Service (NAS) feature operation is transparent to the MCDN Alternate Routing. The NAS drop back function takes priority over the MCDN Alternate Routing drop back function.

Off-Hook Queuing

Off-Hook Queuing (OHQ) takes precedence over the MCDN Alternate Routing feature. At the node where congestion is first encountered, if all outgoing routes are busy, the call is cleared back immediately to the preceding node only if there are no queuing features at this node.

The MCDN Alternate Routing feature comes into operation only at the preceding node when a Call Clearing message is received. OHQ waits until the busy route becomes available. If this route does not become available before OHQ times out, a Call Clearing message is sent.

Overlap Signaling

The MCDN Alternate Routing feature is supported over both the enbloc and overlap signaling methods.

Remote Virtual Queuing

The MCDN Alternate Routing feature takes precedence over Remote Virtual Queuing (RVQ) when congestion is encountered at the tandem node: an attempt is made to find an alternative route instead of informing the call originator to activate Ring Again Allowed.

Trunk Barring

If trunk barring prevents any trunk to trunk connection at the tandem node, the MCDN Alternate Routing feature retries on the next available route in the Route List Index (RLI).

Virtual Network Services

The MCDN Alternate Routing feature can function over all MCDN-based bearer interfaces supporting Virtual Network Services (VNS).

Feature packaging

The MCDN Alternate Routing feature requires the following packages:

- Basic Routing (BRTE) package 14
- Network Class of Service (NCOS) package 32
- Coordinated Dialing Plan (CDP) package 59, or
- Uniform Dialing Plan (UDP)

- UDP requires either Network Alternate Route Selection (NARS) package 58 or Basic Alternate Route Selection (BARS) package 57
- Digital Trunk Interface (DTI) package 75
- ISDN Signaling (ISDN) package 145
- 1.5 Mb Primary Rate Access (PRA) package 146, or
- 2.0 Mb Primary Rate Interface (PRI2) package 154, or
- International Primary Rate Interface (IPRA) package 202, or
- ISDN Signaling Link Interface (ISL) package 147

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 86 – Configure the MCDN Alternate Routing options.

LD 86 – Configure the MCDN Alternate Routing options.

Note: To ensure that MCDN Alternate Routing occurs for all nodes in a system, define all nodes as SBOC = RRA. Conversely, to prevent MCDN Alternate Routing from occurring on any nodes, define all nodes as SBOC = NRR.

Prompt	Response	Description
REQ	CHG	Change existing data.
CUST	xx	Customer number, as configured in LD 15. xx = 0-99 for Options 51C-81C. xx = 0-31 for Option 11C.
FEAT	RLB	Configure the Route List as a feature.
RLI	xxx	Route List Index to be accessed. xxx = 1-127 if a Coordinated Dialing Plan or Basic Alternate Route Selection is used. xxx = 1-255 if Network Alternate Route Selection is configured. xxx = 0-999 if the Flexible Numbering Plan is configured.

ENTR	0-63	Entry number for the NARS or BARS route list.
ROUT	0-511 0-127	Route Number for Options 51C-81C. Route Number for Option 11C.
SBOC		Step Back On Congestion option.
		(NRR) = No re-routing
	RRO	Re-route at the originating node if congestion is encountered. If congestion is encountered at a transit node, drop back to the preceding node so that the preceding node determines if re-routing is needed.
	RRA	Re-route at any node, originating or transit (tandem), when congestion is encountered.
..		
ISET	(0)-64	Initial Set. Number of entries in Initial Set for route list block.
NALT	1-(5)-10	Number of alternate routing attempts. Prompt appears once per RLI.
MFRL	(MIN) 0-7	Set Maximum Facility Restriction Level used to determine autocode prompting. Use default of MiN to set to the minimum FRL value.

Feature operation

There are no operating procedures required to use this feature.

MCDN End to End Transparency

Contents

The following are the topics in this section:

Feature description 1204

Operating parameters 1207

- Operating parameters for NAS using the QSIG transport 1207
- Operating parameters for NACD using the QSIG transport 1208
- Operating parameters for NMS-MC and NMS-MM using the QSIG transport 1208

Feature interactions 1208

- Feature interactions with NAS using the QSIG transport 1208
- Feature interactions with NACD using the QSIG transport 1209
- Feature interactions with NMS-MC using the QSIG transport 1210

Feature packaging 1210

Feature implementation 1213

- Task summary list 1213
- ISDN PRI implementation using the QSIG transport 1215
- ISDN BRI implementation using the QSIG transport 1216
- NAS implementation using the QSIG transport 1217
- NACD implementation using the QSIG transport 1220
- NMS implementation using the QSIG transport 1224

Feature operation 1229

- Direct Message Center call 1230
- Indirect Message Center call 1230

Reference list

The following are the references in this section:

- *Meridian Link ISDN/AP General Guide* (553-2901-100)
- *Network ACD: Description and Operation* (553-3671-120)

Feature description

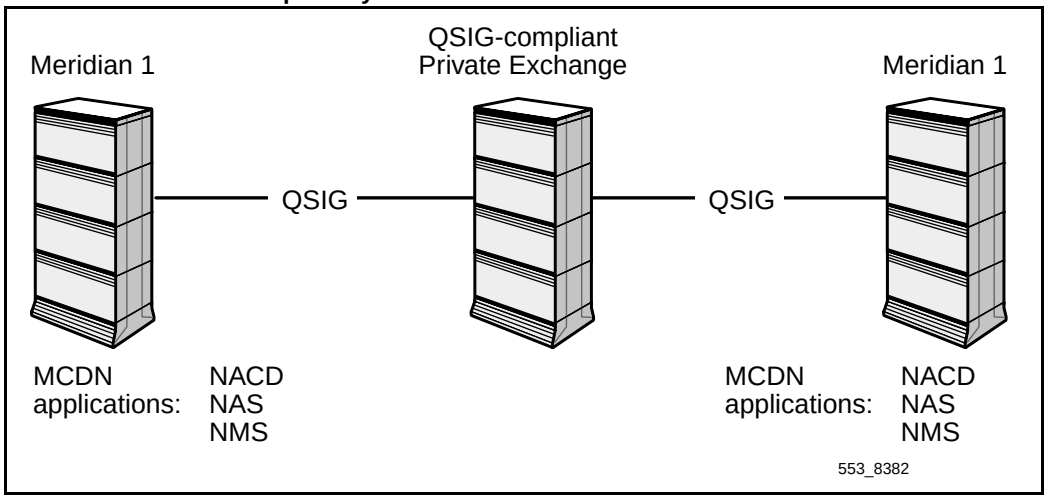
Meridian Customer Defined Network (MCDN) services are based on propriety specific Integrated Services Digital Network (ISDN) signaling. The MCDN End to End Transparency (MEET) feature conveys MCDN proprietary services on a standardized interface, ISDN QSIG. The QSIG gateway supports MCDN features both in a QSIG network and a mixed MCDN/QSIG network. It is the MCDN QSIG conversion tool which provides the basis for support of the selected MCDN applications such as Network Attendant Service (NAS), Network Automatic Call Distribution (NACD), and Network Message Service (NMS). MEET supports the following features:

- MCDN to QSIG encapsulation conversion tool
- NAS using the QSIG transport
- NACD using the QSIG transport
- Network Message Service - Message Center (NMS-MC) and Network Message Service - Meridian Mail (NMS-MM) using the QSIG transport

All three MCDN applications, NAS, NACD, and NMS, are supported over the ISDN Primary Rate Interface (PRI) or the ISDN Basic Rate Interface (BRI) using the QSIG generic functional protocol (transport). Figure 99 illustrates the MEET feature.

Note: ISDN BRI trunk access is not supported in North America.

Figure 99
MCDN End-to-End Transparency



NAS using the QSIG transport

The MEET feature supports NAS on the ISDN Primary Rate Interface (PRI) or the ISDN Basic Rate Interface (BRI) using the QSIG transport.The following NAS functionalities are available on QSIG:

- NAS Routing
- ISDN Call Connection Limitations
- Incoming Call Indication
- Attendant Break-In
- NAS Anti-Tromboning
- Call Extension
- Timed Reminder Recall
- Camp-On
- Call Waiting

For further information about these NAS features, see *Meridian Link ISDN/AP General Guide* (553-2901-100) or the NAS feature description in this document.

NACD using the QSIG transport

The MEET feature supports NACD on the ISDN Primary Rate Interface (PRI) or the ISDN Basic Rate Interface (BRI) using the QSIG transport. The ESN Coordinated Dialing Plan (CDP) or Uniform Dialing Plan (UDP) is required but may not be mixed together. The following NACD functionalities are available on QSIG:

- Make Set Busy (MSB) key
- Not Ready (NRD) key
- Individual DN key (IDN)
- Dialed Number Identification Service (DNIS) and DNIS Name Display
- Calling Line Identification (CLID)
- ACD-C and ACD-D reports

For information about these NACD features, see *Network ACD: Description and Operation* (553-3671-120).

NMS-MC and NMS-MM using the QSIG transport

The MEET feature supports both NMS-MC and NMS-MM on the ISDN Primary Rate Interface (PRI) or the ISDN Basic Rate Interface (BRI) using the QSIG transport.

NMS-MC using the QSIG transport provides:

- Message Center access (direct or indirect)
- Message Waiting Indication notification

A direct call results from a station dialing the DN of the Message Center or pressing the Message Waiting key. An indirect call is a call network redirected to the Message Center.

NMS-MM using the QSIG transport provides:

- Meridian Mail access (direct or indirect)
- Message Waiting Indication notification
- NMS-MM features except Call Sender and Thru-Dialing

For further information about these NMS-MC and MNS-MM features, see *Meridian Link ISDN/AP General Guide* (553-2901-100) or the NAS feature description in this document.

Operating parameters

The Manufacturer Specific Information (MSI) carries the MCDN proprietary information transparently over a QSIG network. The third-party node must support the QSIG generic functional protocol (transport) and MSI.

Directory Number (DN) address translation requires the association with a customer number, as configured using the CUST prompt in LD 15.

Either CDP or UDP is required but they may not be mixed together.

Digit manipulation is not supported for DN transported on QSIG.

Operating parameters for NAS using the QSIG transport

Attendant and users must be located on Meridian 1 nodes to obtain full NAS capabilities.

For NAS Anti-Tromboning capability, both legs must be on the same D-Channel. If the tromboning occurs with one MCDN trunk and one QSIG trunk, the redundant legs are not removed because they are not associated with the same D-Channel.

For a call established through International Standards Organization (ISO) QSIG trunks, the transit counter information is not updated at a QSIG tandem node because the message information is transparent; therefore, the transit counter does not reflect exactly the number of transit nodes the call has gone through.

NAS using the QSIG transport does not support Supervisory Console, Call Park, Charge Account, Do-not disturb and Group Do-not disturb, Barge-in, or Emergency Transfer.

There is no gateway developed between NAS functionalities using the QSIG transport and the corresponding DPNSS services. At a QSIG/DPNSS gateway, if NAS information is present, the NAS information is discarded.

Operating parameters for NACD using the QSIG transport

With the MEET feature, NACD continues to work fully with Symposium in an MCDN network. The MEET feature does not support NACD with Symposium using the QSIG transport or a mixed MCDN/QSIG network.

Messages which are resent at the first timer expiration on MCDN are sent once only on QSIG. At the first timer expiration on QSIG, the transaction is cancelled. This applies to the following messages: database update, the logical call request, the cancellation (from source or from target and for any reason) and the status exchange.

Operating parameters for NMS-MC and NMS-MM using the QSIG transport

NMS-MC and NMS-MM using the QSIG transport indirect access are based on the QSIG Call Diversion feature. The QSIG Call Diversion feature must be available and configured in the network.

NMS-MC using the QSIG transport is provided for NMS-MC users and operations located on Meridian 1 nodes.

NMS-MM using the QSIG transport supports all NMS-MM features except Call Sender and Thru-Dialing.

Feature interactions

Feature interactions with NAS using the QSIG transport

Interactions specific to NAS using the QSIG transport are discussed in the following section. Refer to *Meridian Link ISDN/AP General Guide* (553-2901-100) or the NAS feature description in this document, for generic NAS feature interactions.

QSIG Transit Counter

The QSIG Transit Counter Information Element (IE) is defined only with the ETSI interface; it carries the number of transit nodes the call has gone through. It is updated when a SETUP is sent on an ETSI QSIG trunk. Similarly, the NAS ISDN Call Connection Limitations (ICCL) information is updated when a SETUP is sent on a NAS MCDN or QSIG trunk.

For a call established using the International Standards Organization (ISO) interface for QSIG trunks, the counter information is not updated at a QSIG tandem node because the message information is transparent; therefore, the transit counter does not reflect exactly the number of transit nodes the call has gone through.

QSIG Attendant Recall

QSIG Attendant Recall allows a call extended on an ETSI QSIG trunk to recall the attendant if it is not answered within a customer-defined time. When ETSI QSIG is used and MQC_FEAT is set to NAS, NAS Timed Reminder Recall is enabled and takes precedence over QSIG Attendant Recall.

QSIG ANF Path Replacement/QSIG Call Transfer

QSIG ANF Path Replacement allows an established connection through a QSIG private network to be replaced by a new connection after a call modification to obtain a more efficient connection. It handles triangulation as well as tromboning mechanisms.

QSIG ANF Path Replacement take precedence on NAS anti-tromboning if the “Call transfer complete” FACILITY message is received before the ‘Call extension complete” FACILITY message. Otherwise, NAS anti-tromboning applies and the QSIG ANF Path Replacement is not initiated when a ‘Call transfer complete’ FACILITY message is received.

Feature interactions with NACD using the QSIG transport

Interactions specific to NACD using the QSIG transport are discussed in the following section. Refer to *Network ACD: Description and Operation* (553-3671-120) for information on generic NACD feature interactions.

QSIG Name Display

When QSIG Name Display is configured using the QSIG transport D-Channels and the name is allowed to be displayed and if the call is diverted to the target node through NACD routing, the originator’s name is displayed on the target agent’s set and the name of the target agent’s ACD DN is displayed on the originator’s set when the target agent answers the call.

Feature interactions with NMS-MC using the QSIG transport

Interactions specific to NMS-MC using the QSIG transport are discussed in the following section. Refer to*Network ACD: Description and Operation* (553-3671-120) for information on generic NACD feature interactions.

NACD and NAS encapsulation within QSIG

For ACD and attendant Message Centers that are NACD or NAS, the ACD agents and attendants may reside at different nodes. With packaging requirements satisfied at the node where the MC call is presented, either the NACD agents or the NAS attendants are treated as a Message Center.

If the Message Center is an attendant, the NMS-MC feature operation remains the same as for a simple NMS-MC set. If the attendant NMS-MC has a specific ICI key defined, when a message Waiting call terminates to the attendant NMC-MC, the ICI lamp changes to lit to indicate a NMS-MC call.

As for MCDN, it is not recommended to use NACD or NAS as a NMS-MC unless the message data base can be made available to all agents or attendants at different nodes.

Feature packaging

MEET requires these packages:

- Multi-purpose Serial Data Link (MSDL) package 222
- QM reference signaling point Interface (QSIG) package 263
- QSIG Generic Functional protocol (QSIGGF) package 305
- MCDN End to End Transparency (MEET) package 348

Depending on the application, other packages are also required.

For the QSIG ISDN PRI interface, the following packages are also required:

- ISDN Signaling (ISDN) package 145
- Advanced ISDN Network Services (NTWK) package 148
- 1.5 Mb Primary Rate Access (PRA) package 146, or
- 2.0 Mb Primary Rate Interface (PRI2) package 154, or
- International Primary Rate Interface (IPRA) package 202

The following software packages are required for this feature to operate over QSIG ISDN BRI Trunks:

Note: ISDN BRI trunk access is not supported in North America.

- Basic Rate Interface (BRI) 216
- ISDN BRI Trunk Access (BRIT) 233

For NAS using the QSIG transport, you must have the ISDN PRI packages or ISDN BRI package and the following packages (the same packages as required for on the MCDN transport):

- Basic Routing (BRTE) package 14
- Basic Queuing (BQUE) package 28
- Network Class of Service (NCOS) package 32
- Network Alternate Route Selection (NARS) package 58
- Coordinated Dialing Plan (CDP) package 59
- Flexible Call Back Queuing (FCBQ) package 61
- Multi-Tenant Service (TENS) package 86
- Attendant Break-In/Trunk Offer (BKI) package 127
- Network Attendant Service (NAS) package 159
- ISDN Supplementary Features (ISDN INTL SUP) package 161
- Remote Virtual Queuing (ORC/RVQ) package 192

Note 1: NAS packages and Attendant Overflow Position (AOP) are mutually exclusive and cannot be equipped on the same system.

Note 2: NAS packages and Centralized Attendant Service (CAS) are mutually exclusive and cannot be packaged together.

For NACD using the QSIG transport, you must have the ISDN PRI packages or the ISDN BRI package and the following packages (the same packages as required for NACD on the MCDN transport):

- Basic Routing (BRTE) package 14
- Digit Display (DDSP) package 19

- Basic Queuing (BQUE) package 28
- Network Class of Service (NCOS) package 32
- Basic Automatic Call Distribution (BACD) package 40
- Automatic Call Distribution, Package B (ACDB), package 41
- Basic Alternate Route Selection (BARS) package 57 **or** Coordinated Dialing Plan (CDP) package 59 **or** Network Alternate Route Selection (NARS) package 58
- ACD Enhanced Flow (EOVF) package 178
- Network Automatic Call Distribution (NACD) package 207

For NMS-MC using the QSIG transport, you must have the ISDN PRI packages or ISDN BRI package and the following packages (the same packages as required for NMS-MC on the MCDN transport):

- Message Waiting Center (MWC) package 46
- Network Message Services (NMS) package 175

In addition, Automatic Call Distribution (ACD) Messages Services require the following ACD packages.

- Basic Automatic Call Distribution (BACD) package 40
- Automatic Call Distribution, Package B (ACDB), package 41
- Automatic Call Distribution, Package C, (ACDC) package 42
- Automatic Call Distribution, Package A (ACDA) package 45

For NMS-MM using the QSIG transport, you must have the ISDN PRI packages or ISDN BRI package and the following packages (the same packages as required for NMS-MM on the MCDN transport):

- End-To-End Signaling (EES) package 10
- Integrated Message System (IMS) package 35 (for home node only)
- Basic Automatic Call Distribution (BACD) package 40
- Automatic Call Distribution, Package A (ACDA) package 45
- Message Waiting Center (MWC) package 46

- Command/Status Link (CLS) package 77
- Network Message Services (NMS) package 175

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 17 – Configure a D-Channel for an ISDN PRI interface using the QSIG transport and add MCDN features.

2 LD 16 – Configure route for an ISDN BRI interface using the QSIG transport and add MCDN features.

3 LD 12 – Configure Attendant Consoles with NAS keys. (optional)

4 LD 15 – Enable or disable network attendant control, NAS routing, and define a trunk ICI key.

5 LD 86 – Define NAS routing tables.

6 LD 15 – Configure a CLID table.

7 LD 23 – Configure ACD Directory Number queues at source and target nodes.

8 LD 23 – Configure an NACD Routing Table.

9 LD 11 – Define a Meridian 1 proprietary ACD set at source and/or target node.

10 LD 10 – Define an analog (500/2500) set at source and/or target node.

11 LD 15 – Allow Message Waiting Center access..

12 LD 11 – Define a Meridian 1 proprietary ACD agent set at source and/or target node.

13 LD 11 – Define a Meridian 1 proprietary NMS-MC user set.

14 LD 23 – Create primary voice messaging ACD queue.

15 LD 11 – Add agents to the primary agent queue.

16 LD 23 – Configure ACD parameters for all voice service queue.

To implement MEET, follow these steps:

- In LD 17, configure a D-Channel for a PRI interface using the QSIG transport and select the NAS, NACD and/or NMS MCDN features

or

- In LD 16, configure a route for an ISDN BRI interface using the QSIG transport and add the NAS, NACD and/or NMS MCDN features.

After selecting NAS in LD 17 or LD 16, to configure NAS for a QSIG link, follow these steps:

- In LD 12, configure attendant consoles with NAS key (optional).
- In LD 15, enable or disable network attendant control, NAS control and define trunk ICI keys and NAS routing thresholds in LD 15.
- In LD 86, define the NAS routing table.

After selecting NACD in LD 17 or LD 16, to configure NACD for a QSIG link, follow these steps:

- Define a CDP or UDP between the two nodes in LD 87 and LD 90.
- In LD 15, configure a CLID table.
- In LD 23, configure the ACD DN queue at source and target nodes.
- In LD 23, configure the NACD routing table in LD 23.
- In LD 11, define a Meridian 1 proprietary ACD set at source and/or target node.

After selecting NMS in LD 17 or LD 16, to configure NMS-MC for a QSIG link, follow these steps:

- Define a CDP (DSC or LSC) or UDP between the two nodes in LD 87 and LD 90.
- In LD 15, allow Message Waiting Center access.
- In LD 11, define a Meridian 1 proprietary ACD agent set at source and/or target node.
- In LD 11, define a Meridian 1 proprietary NMS-MC user set.

After selecting NMS in LD 17 or LD 16, to configure NMS-MM for a QSIG link, follow these steps:

- Configure the primary voice messaging ACD queue at the prime location (where Meridian Mail is installed) in LD 23.
- Add agents to the primary agent queue in LD 11.
- Configure ACD parameters for all voice service queues in LD 23.
- Configure the Voice Services DN (VSDN) table in NMS-MM administration terminal. Refer to Meridian Mail documentation for this configuration information.

ISDN PRI implementation using the QSIG transport

LD 17 – Configure a D-Channel for an ISDN PRI interface using the QSIG transport and add MCDN features.

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	CFN	Configuration database.
...		
ADAN	CHG DCH aaa	Change D-Channel information.
...		
- IFC	ESGF ISGF	ETSI QSIG interface with GF platform. ISO QSIG interface with GF platform.
...		

- RCAP	MQC	Add MCDN QSIG Conversion as a new remote capability. XMQC removes MCDN QSIG Conversion as a remote capability.
-- MQC_FEAT		MCDN QSIG feature type. Prompted if RCAP = MQC. Precede MQC feature type with X to remove.
	NAS	Enable NAS on QSIG. XNAS disables NAS on QSIG.
	NACD	Enable NACD on QSIG. XACD disables NACD on QSIG
	NMS	Enable NMS on QSIG. XNMS disables NMS on QSIG.

ISDN BRI implementation using the QSIG transport

LD 16 – Configure route for an ISDN BRI interface using the QSIG transport and add MCDN features.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	RDB	Route Data Block.
TKTP	a...a	Trunk Type.
...		
DTRK	(NO) YES	Digital Trunk Route.
- BRIP	(NO) YES	ISDN BRI Packet handler route
- DGTP	a...a	Digital Trunk Type for route.
	BRI	Basic Rate Interface (Allowed if TKTP = TIE, COT or DID and BRIP = NO
...		

- IFC	ESGF ISGF	ETSI QSIG interface with GF platform. ISO QSIG interface with GF platform.
...		
- RCAP	MQC	Add MCDN QSIG Conversion as a new remote capability. XMQC removes MCDN QSIG Conversion as a remote capability.
-- MQC_FEAT		MCDN QSIG feature type. Prompted if RCAP = MQC. Precede MQC feature type with X to remove.
	NAS	Enable NAS on QSIG.
	NACD	Enable NACD on QSIG.
	NMS	Enable NMS-MC and NMS-MM on QSIG.

NAS implementation using the QSIG transport

To configure NAS using the QSIG transport, follow these steps:

- Configure an ISDN PRI interface using the QSIG transport and select NAS as an MCDN feature in LD 17, or configure an ISDN BRI interface using the QSIG transport or and select NAS as an MCDN feature in LD 16.
- Configure NAS for a QSIG link:
  - — Configure attendant consoles with NAS key (optional) in LD 12.
  - — Enable or disable network attendant control, NAS control and define trunk ICI keys and NAS routing thresholds in LD 15.
  - — Define the NAS routing table in LD 86.

LD 12 – Configure Attendant Consoles with NAS keys. (optional)

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change data.
TYPE	ATT aaaa	Type of console. aaaa = 1250 or 2250.
TN		Terminal Number.
	l s c u c u	l = loop, s = shelf, c = card, u = unit for Options 51-81C. c = card, u = unit for Option 11C.
...		
KEY	xx NAS	xx = the key number assigned the NAS function. Each attendant console can have only one NAS key defined. This key is optional.

LD 15 – Enable or disable network attendant control, NAS routing, and define a trunk ICI key.

Prompt	Response	Description
REQ:	NEW CHG	Add new data. Change existing data.
TYPE:	ATT	Attendant data.
TN		Terminal Number.
	l s c u c u	l = loop, s = shelf, c = card, u = unit for Options 51-81C. c = card, u = unit for Option 11C.
...	...	...
- ISDN	YES	Integrated Services Digital Network.
...	...	...

- ICI	0-19	Key number. Followed with a space and the trunk type.
	NCO NDID NTIE NFEX NWAT	Network CO trunk. Network DID trunk. Network TIE trunk. Network FEX trunk. Network WAT trunk.
...	...	...
- CWCL	(0)-255 (0)-255	Call Waiting Call Limit. Lower and upper thresholds.
- CWTM	(0)-511 (0)-511	Call Waiting Time. Lower and upper thresholds (in seconds).
...	...	...
- NAS ATCL	YES (NO)	Allow/deny attendant control for call extension.
- NAS ACTV	YES (NO)	Allow/deny NAS routing.

LD 86 – Define NAS routing tables.

Prompt	**Response**	**Description**
REQ	NEW CHG	Add new data. Change existing data.
CUST	xx	Customer number. xx = 0-99 for Options 51C-81C. xx = 0-31 for Option 11C.
FEAT	NAS	Type of data.
TBL	0-63	Routing table number. Without Multi-Tenant Service, 0 is the customer routing table. With Multi-Tenant Service enabled, NAS tables 1-63 may be associated with Console Presentation Groups (CPGs) 1-63.
ALT	1-7	An alternative attendant or routing table. (To clear an old number, type an X before typing the new number. The old number cannot be cleared if it is associated with a schedule period. Reach TODS by pressing the return key.)

ID	xx...x <CR>	The dialed digits (including the network access code) needed to reach an attendant associated with the alternative number. Respond with a string of up to 16 digits to change the attendant ID. Press the return key to leave the ID unchanged, exit the prompt, and return to ALT.
TODS	0-31	Time of Day schedule where; 0 = default to handle all time periods not defined in 1 through 31. Press the return key to continue the NAS feature setup process.
- PER	hr: mm hr: mm <CR>	Specify start and stop times for the period using 24-hour format. Start time must be before stop time. mm = 00 or 30 only. <CR> = leave times unchanged; move to the DAYS prompt.
- DAYS	a,a...a	Specify applicable days of the week for the time period. Input a number representing each day for which the schedule is active (where 1=Monday, 2=Tuesday... 7=Sunday).
ALST	1-7	Alternatives list to be used for the schedule period.
DBK	(NO) YES	Disable/enable Drop Back busy option.
QUE	(NO) YES	Disable/enable queuing to a route.

NACD implementation using the QSIG transport

To configure NACD using the QSIG transport, follow these steps:

- Configure an ISDN PRI interface using the QSIG transport or and select NACD as an MCDN feature in LD 17, or configure an ISDN BRI interface using the QSIG transport or and select NACD as an MCDN feature in LD 16.
- Configure NACD for a QSIG link:
  - — Define a CDP or UDP between the two nodes.
  - — Configure a CLID table in LD 15.
  - — Configure the ACD DN queue at source and target nodes in LD 23.

— Configure the NACD routing table in LD 23.

— Define a Meridian 1 proprietary ACD telephone at source and/or target node in LD 11.

LD 15 – Configure a CLID table.

Prompt	Response	Description
REQ:	NEW CHG	Add new data. Change existing data.
TYPE:	NET	Networking data (if REQ = CHG only).
CUST	xx	Customer number. xx = 0-99 for Options 51C-81C. xx = 0-31 for Option 11C.
...		
- CLID		CLID option.
	YES (NO)	Configure a CLID table for the customer. (the default) do not configure a CLID table. Remaining prompts are not generated and no CLID is sent for the customer.
...		
- - ENTRY	y	CLID entry number.

LD 23 – Configure ACD Directory Number queues at source and target nodes.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	ACD	Automatic Call Distribution data block.
CUST	xx	Customer number. xx = 0-99 for Options 51C-81C. xx = 0-31 for Option 11C.
...		
ACDN	xxxx	ACD Directory Number.

LD 23 – Configure an NACD Routing Table.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	aaaa	Type of data block. Enter NACD for Network ACD.
CUST	xx	Customer number. xx = 0-99 for Options 51C-81C. xx = 0-31 for Option 11C.
ACDN	xxxx	ACD Directory Number.
TABL	a	Day or Night Table. a = D or N.
- OUTS	xxxx xxxx	Routing Table entries to be removed.
- TRGT	xxxx tttt	Target ACD DN and the timer in seconds.

LD 11 – Define a Meridian 1 proprietary ACD set at source and/or target node.

Note: When assigning a CLID entry to an ACD set, you cannot use the position ID already on the set. You must out the set first or null the ACD key and then rebuild with the table entry number.

Prompt	Response	Description
REQ:	NEW CHG	Add new data. Change data.
TYPE:	aaaa	Type of set. aaaa = SL1, 2006, 2008, 2009, 2016, 2018, 2112, 2216, 2317, 2616, 3000.
TN	 l s c u c u	Terminal Number. l = loop, s = shelf, c = card, u = unit for Options 51-81C. c = card, u = unit for Option 11C.
...		
CLS	(AGN) SPV	Class of Service group. AGN = (default) ACD Agent. SPV = ACD Supervisor.
...		
KEY	xx ACD yyyy 0-N/D zzzz	ACD key, where: xx = key number (*must be key 0*). yyyy = ACD DN or Message Center DN. 0-N = CLID entry, with N = CLID SIZE-1 (SIZE defined in LD 15). D = CLID entry, Search for a CLID entry from key 0 upwards, to find a DN key. the found CLID is used as the CLID entry for the active DN key. zzzz = ACD agent's position ID. Please refer to the note at the top of LD 11 on assigning a CLID entry to an ACD set.
KEY	 xx MSB yyyy (0)-N/D) xx NRD yyy (0)-N/D	Telephone function key assignments. xx = key number. MSB = Make Set Busy key. NRD = Not Ready key.

LD 10 – Define an analog (500/2500) set at source and/or target node.

Prompt	Response	Description
REQ:	NEW CHG	Add new data. Change existing data.
TYPE:	aaaa	Type of set. aaaa = analog (500 or 2500) set.
TN		Terminal Number.
	l s c u c u	l = loop, s = shelf, c = card, u = unit for Options 51-81C. c = card, u = unit for Option 11C.
...		
CLS	AGTA	ACD services for analog (500/2500) sets allowed.
...		
FTR	ACD xxxx 0-N/D zzzz	ACD feature where: aaa = ACD. xxxx = ACD DN. 0-N/D = CLID entry. zzzz = ACD agent's position ID.

NMS implementation using the QSIG transport

To configure NMS-MC using the QSIG transport, follow these steps:

- Configure an ISDN PRI interface using the QSIG transport or and select NMS as an MCDN feature in LD 17, or configure an ISDN BRI interface using the QSIG transport or and select NMS as an MCDN feature in LD 16.
- Configure NMS-MC for a QSIG link:
  - — Define a CDP (DSC or LSC) or UDP between the two nodes.
  - — Allow Message Waiting Center access in LD 15.
  - — Define a Meridian 1 proprietary ACD agent set at source and/or target node in LD 11.
  - — Define a Meridian 1 proprietary NMS-MC user set in LD 11.

LD 15 – Allow Message Waiting Center access.

Prompt	Response	Description
REQ:	NEW CHG	Add new data. Change existing data.
TYPE:	FTR	Feature data.
CUST	xx	Customer number. xx = 0-99 for Options 51C-81C. xx = 0-31 for Option 11C.
OPT	(MCX) MCI	Message Center excluded. Message Center included.
	(MWUD) MWUA	Message Waiting Unconditional Denied. Message Waiting Unconditional Allowed.

LD 11 – Define a Meridian 1 proprietary ACD agent set at source and/or target node.

Prompt	Response	Description
REQ:	NEW CHG	Add new data. Change existing data.
TYPE:		Type of set.
	aaaa	SL1, 2006, 2008, 2009, 2016, 2018, 2112, 2216, 2317, 2616, 3000.
TN		Terminal Number.
	l s c u c u	l = loop, s = shelf, c = card, u = unit for Options 51-81C. c = card, u = unit for Option 11C.
...		
CLS		Class of Service options.
	(MWD) MWA	Message Waiting Denied Message Waiting Allowed.
...		

KEY	xx MIK	MIK = Message Indication Key. xx = key number.
	xx MCK	MCK = Message Cancellation Key. xx = key number.

LD 11 – Define a Meridian 1 proprietary NMS-MC user set.

Prompt	Response	Description
REQ:	NEW CHG	Add new data. Change existing data.
TYPE:	aaaa	Type of set. aaaa = SL1, 2006, 2008, 2009, 2016, 2018, 2112, 2216, 2317, 2616, 3000.
TN		Terminal Number.
	l s c u c u	l = loop, s = shelf, c = card, u = unit for Options 51-81C. c = card, u = unit for Option 11C.
CLS	AGTA	ACD services for analog (500/2500) sets allowed.
KEY	xx MWK x...x	Telephone function key assignments where: xx = key number. MWK = Message Waiting Key x...x = NMS-MC DN.

To configure NMS-MM on QSIG, follow these steps:

- Configure an ISDN PRI interface using the QSIG transport or and select NMS as an MCDN feature in LD 17, or configure an ISDN BRI interface using the QSIG transport or and select NMS as an MCDN feature in LD 16.
- Configure NMS-MM for a QSIG link:
- Configure the primary voice messaging ACD queue at the prime location (where Meridian Mail is installed) in LD 23.
- Add agents to the primary agent queue in LD 11.
- Configure ACD parameters for all voice service queues in LD 23.

- Configure the Voice Services DN (VSDN) table in NMS-MM administration terminal.

LD 23 – Create primary voice messaging ACD queue.

Prompt	Response	Description
REQ	NEW	Add new data.
TYPE	ACD	Type of data block. ACD = Automatic Call Distribution data block.
CUST	xx	Customer number. xx = 0-99 for Options 51C-81C. xx = 0-31 for Option 11C.
ACDN	xxxx	ACD DN = Express Messaging DN (the DN which users dial to access their mailboxes).
MWC	YES	ACD DN is a message center DN.
.		
NCFW	xx...x	Night Call Forward DN (up to 23 digits).
...		

LD 11 – Add agents to the primary agent queue.

Note: When assigning a CLID entry to an ACD set, you cannot use the position ID already on the set. You must out the set first or null the ACD key and then rebuild with the table entry number.

Prompt	Response	Description
REQ:	NEW	Add new data.
TYPE:	xx	ACD data block.
TN		Terminal Number.
	l s c u c u	l = loop, s = shelf, c = card, u = unit for Options 51-81C. c = card, u = unit for Option 11C.

...		
CLS	VMA	Allow voice messaging.
...		
KEY		xx = key number
	xx ACD yyyy 0-N/D zzzz	ACD key, where: xx = key number (*must be key 0*). yyyy = ACD DN or Message Center DN. 0-N = CLID entry, with N = CLID SIZE-1 (SIZE defined in LD 15). D = CLID entry, Search for a CLID entry from key 0 upwards, to find a DN key. the found CLID is used as the CLID entry for the active DN key. zzzz = ACD agent's position ID. Please refer to the note at the top of LD 11 on assigning a CLID entry to an ACD set.
	xx SCN yyyy (ccc or D).	Single Call Non-Ringing DN where: yyyy = DN ccc = CLID entry of (0)-N, where N = the value entered at the SIZE prompt in LD 15 minus 1. D = the character D may be entered to search a CLID entry from key 0 and up to find a DN key. The CLID associated with the found DN key will then be used. The DN can be up to 4 digits, up to 7 digits with Directory Number Expansion (DNXP) package 150. Once the SCN key has been defined, MARO is prompted.
	xx MSB	Make Set Busy key.
	xx NRD	Not Ready key.
	xx TRN	Call Transfer key.

	xx A03 xx A06 xx RLS	A03 = Three-Party Conference key. A06 = Six-Party Conference key. Release key. Requires CLS = LUXA. Key/lamp pair is not required.

LD 23 – Configure ACD parameters for all voice service queue.

Prompt	Response	Description
REQ	NEW	Add new data.
TYPE	ACD	Automatic Call Distribution data block.
CUST	xx	Customer number. xx = 0-99 for Options 51C-81C. xx = 0-31 for Option 11C.
ACDN	x...x	ACD Directory Number.
MWC	(NO) YES	Message Waiting Center.
...		
MAXP	xxxx	Maximum number of positions. Enter 1.
...		
NCFW	xx...x	Night Call Forward DN = DN of the primary voice messaging queue in network format. xx...x = up to 23 digits.

Feature operation

Feature operation for direct Message Center calls and Indirect Message Center calls are presented in the following sections.

For NAS and NMS-MC and NMS-MM feature operation, see *Meridian Link ISDN/AP General Guide* (553-2901-100) or the NAS feature description in this document.

For NACD feature operation, see *Network ACD: Description and Operation* (553-3671-120).

Direct Message Center call

1 User A dials their MC DN or presses their MWK key.

2 The MC rings. For ACD sets, the MCK lamp state shows the MC user's message indication state: lit if there is no message; slow flash if a message is waiting; fast flash if there is bad data; dark if message waiting indication class of service is denied.

3 The MC operator answers the call. For DN sets, the MCK lamp state reflects MC user's message indication state.

4 User B is connected to MC and is given their message by the MC operator.

5 The MC operator presses MCK key (if MCK lamp is flashing) to turn off message waiting indication at station B. The MCK lamp changes to dark.

6 User A disconnects from the MC.

Indirect Message Center call

1 User A calls User B.

2 User B has calls redirected to the MC (Call Forward all Calls or No Answer).

3 Call is presented to the MC; MC rings; MC operator answers the call.

4 If QSIG Diversion is configured, the MIK lamp has the lamp state that reflects the MC user's message indication state: lit if there is no message; flash if a message is waiting; fast flash if there is bad data; dark if message waiting indication class of service is denied.User A is connected to MC and leaves a message.

5 If QSIG diversion is not configured, the MC operator activates the Message Waiting indication in the following sequence:

— MC operator puts the call On Hold, presses the MIK key and MIK lamp lights.

— MC operator dials User B's DN. The MIK lamp changes to the lamp state that reflects the MC user's message indication state.

— If the MIK lamp is lit, the MC operator presses the MIK key to turn on the message waiting indication at station B, The MIK lamp changes to dark.

— The MC operator returns to the Held call.

6 User A disconnects from the call.

Meridian Hospitality Voice Services

Contents

The following are the topics in this section:

Feature description 1233
Message Waiting Indication Enhancement 1234
ISDN/AP recovery enhancement 1234
Operating parameters 1235
Feature interactions 1235
Feature packaging 1237
Feature implementation 1238
Task summary list 1238
Feature operation 1239

Feature description

This feature provides an enhanced form of Meridian Mail tailored to Hospitality Services. It simplifies the use of mailboxes and allows more dynamic management of mailboxes as guests check in and out.

Two components of this feature rely on ISDN. These are:

- Property Management System Interface Enhancement (Message Waiting Indication Enhancement)
- ISDN/AP Recovery Enhancement

Message Waiting Indication Enhancement

Under the Property Management System Interface enhancement, Text Messaging on a Property Management System (PMS) and Voice Mail on Meridian Mail are integrated. The handling of Message Waiting Indications from the ISDN/AP is enhanced to ensure that Meridian Mail controls the Message Waiting status for both voice and text messages. Message Waiting Indications will be handled only by way of the ISDN/AP link (when that link is enabled).

Note: If the ISDN/AP link is disabled for any reason, the PMS link will be used to update Message Waiting Indication status.

ISDN/AP recovery enhancement

The ISDN/AP link is used to pass all of the command and status information between the SL-1 and any Value Added Server (VAS). When the ISDN/AP link fails, due either to faults in the link itself or failure of the VAS, all signaling between the SL-1 and the VAS stops. Calls could be left in various ringing states indefinitely (until the ISDN/AP link is restored).

The ISDN/AP Recovery Enhancement ensures that callers to any VAS, using a particular ISDN/AP link, are redirected to some alternate DN, should that ISDN/AP link fail. This redirection only applies to calls in the ringing state which are being presented to virtual Voice Messaging Service agents. Calls in the following call states can be recovered under this enhancement:

- calls ringing to a virtual Voice Messaging Service agent, but not yet answered by the VAS
- calls in an ACD queue at the time the failure is detected
- new calls arriving at the queue after the failure is detected, but before the link is restored

Calls are recovered from ACD queues under the following conditions:

- The ACD queue is defined as a Message Waiting Center.
- The ACD queue uses the ISDN/AP.
- All ISDN/AP links associated with the ACD queue are not active.
- If an ACD agent is involved in the call, the agents must be defined as Virtual Voice Messages access agents for the enhancement to take effect.

When calls are redirected, they are routed to the Night Call Forward DN (NCFW) for the particular ACD queue involved. The treatment of calls will be identical to that of existing Night Call Forward operation for ACD queues, except that the Night Call Forward DN must be located on the same SL-1 switch as the attendant and room telephones.

When the ISDN/AP link fails, any calls without disconnect supervision which are connected to the VAS are disconnected immediately. Calls with disconnect supervision remain connected, until the originating end disconnects. In either case, a CDR record is produced when the call is released from the agent.

When the ISDN/AP link becomes operational once again (through either automatic or manual recovery), the handling of new calls will return to normal.

Operating parameters

No operating parameters are specified for this feature.

Feature interactions

Attendant End-to-End Signaling (AEES)

AEES, which uses Dual-tone Multifrequency signaling, requires an additional Attendant EES key.

Attendant Overflow Position (AOP)

Attendant Overflow allows unanswered calls to the attendant to be forwarded to a customer-defined DN after a defined time. With AOP equipped, overflowed calls can be directed to Meridian Mail. The AOP DN must be defined as an ACD DN, and the ACD DN must be an ACD agent configured as a Virtual Voice Messaging Service (VMS) agent. A call may also be overflowed if all the attendants are in Position Busy.

Centralized Attendant Service (CAS)

The attendant must be located on the same switch as Meridian Mail for the attendant to use Meridian Mail features.

Digit Key Signaling (DKS)

With the DKS package (180) equipped, attendants assist callers in operating Meridian Mail Voice Messaging Service. The attendant enters the digits for Meridian Mail and extends the call to Meridian Mail. The caller may then access voice messaging. DKS is only supported from the attendant consoles local to Meridian Mail. The attendant may also place direct calls to Meridian Mail.

Digit Key Signaling at Console (DKS)

With DKS equipped, attendants assist callers in Meridian Mail activities. The attendant extends source calls to Meridian Mail or direct calls to Meridian Mail.

Do Not Disturb (DND)

Individual DND allows the attendant to place a DN in the Do Not Disturb mode. A DN in this mode is free to originate calls, but appears busy to incoming calls. With DND equipped, callers can be redirected to Meridian Mail for Voice Mail Services. A called set must have Hunting Allowed (HTA) Class of Service and the Customer Route Data Block must be set to "YES" in LD 15.

M2317, M3000, and Meridian Modular Softkey Menus

M2317, M3000, or Meridian Modular soft key menus will not be supported by MHVS. These three telephones with CCSA Class of Service will not be presented with the Meridian Mail softkey menus when connected to Meridian Mail.

Network Automatic Call Distribution

The Night Number specified for the Automatic Call Distribution (ACD) involved in the ISDN/AP recovery operation must be local to the node.

PMSI, DKS, DND, and Message Waiting Indication

These operations are only supported when PMSI, Meridian Mail, and attendant room telephones are located on the same switch.

Pretranslation

Prior to MHVS, the setup of calls using the ISDN/AP was not supported from telephones using the Pretranslation feature. With MHVS equipped, call setup using the ISDN/AP is supported.

Stripping of Calling Party Name Display (CPND) Blanks

The maximum length of a CPND name sent from the PMSI/Background (BGD) terminal is 27 characters. When the full 27-character length is used, part of the CPND name may scroll off the screen. To avoid this problem, the PMSI/BGD software has been updated to strip all trailing blanks from the CPND name from the screen.

Feature packaging

Meridian Hospitality Voice Services (MHVS) requires software package 179.

The standard Meridian Mail packages must be equipped for the Pretranslation and Do Not Disturb functions to operate properly. These include:

- Recorded Announcement (RAN) package 7;
- End to End Signaling (EES) package 10;
- Make Set Busy (MSB) package 17;
- Integrated Message Services (IMS) package 35;
- Basic Automatic Call Distribution (BACD) package 40;
- Automatic Call Distribution Package A (ACDA) package 45;
- Message Waiting Center (MWC) package 46;
- Command Status Link (CSL) package 77;
- CSL with Alpha Signaling (CSLA) package 85; and
- Auxiliary Processor Link (APL) package 109.

The Property Management System Interface (PMSI) package requires the following packages:

- Controlled Class of Service (CCOS) package 81;
- Background Terminal (BGD) package 99;
- Room Status (RMS) package 100; and
- Property Management System Interface (PMSI) package 103.

The Attendant Overflow (AOP) package 56 is required for AOP DN enhancement.

The Digit Key Signaling (DKS) package 180 requires that the standard Meridian Mail packages, such as those listed under Meridian Hospitality Voice Services (MHVS) package 179, are equipped.

The site may also require other packages such as PPM/Message Registration (MR) package 101 and Automatic Wake-up (AWU) package 102; however, these packages do not impact MHVS operations.

Integrated Services Digital Network (ISDN) package 145 is also required.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1. LD 15 – Allow call redirection to Meridian Mail for voice messaging.
2. LD 23 – Define the Attendant Overflow Position (AOP) Directory Number.

LD 15 – Allow call redirection to Meridian Mail for voice messaging.

Prompt	Response	Description
REQ:	CHG	Change.
TYPE:	RDR	Call Redirection data.
CUST	xx	Customer number.
...		
DNDH	YES	Do Not Disturb Hunting. MHVS package (179) must be equipped for this prompt to appear. LD 21 will reflect the DNDH option if MHVS is equipped.

LD 23 – Define the Attendant Overflow Position (AOP) Directory Number.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.

TYPE	ACD	Automatic Call Distribution Data Block.
CUST	xx	Customer number.
ACDN	xxxx	ACD Directory Number.
MWC	YES	ACD DN Message Center DN.
CMS	YES	Command and status link.

Feature operation

There are no operating procedures specified for this feature.

Meridian Mail Trunk Access Restriction

Contents

The following are the topics in this section:

Feature description 1241
Operating parameters 1244
Feature interactions 1244
Feature packaging 1245
Feature implementation 1245
Task summary list 1245
Feature operation 1246

Feature description

The Meridian Mail Trunk Access Restriction (MTAR) feature prevents direct or indirect call transfer or conference of external calls to Meridian Mail. In this feature, external calls are defined as incoming/outgoing trunk calls that originate or terminate outside a private network.

This definition is applicable to all types of trunks, with the exception of TIE trunk calls. External calls are separated from a transferring/conferencing set on a network using TIE trunks. MTAR operation is dependant on the information sent to the remote node from the node that is attempting to transfer/conference.

MTAR is triggered if the network information (such as Network Attendant Service or Calling Line Identification) indicates that an external call and a transfer/conference attempt to Meridian Mail is occurring. MTAR is also triggered if local information, such as Route Class, indicates an external call and a transfer/conference attempt to Meridian Mail is occurring.

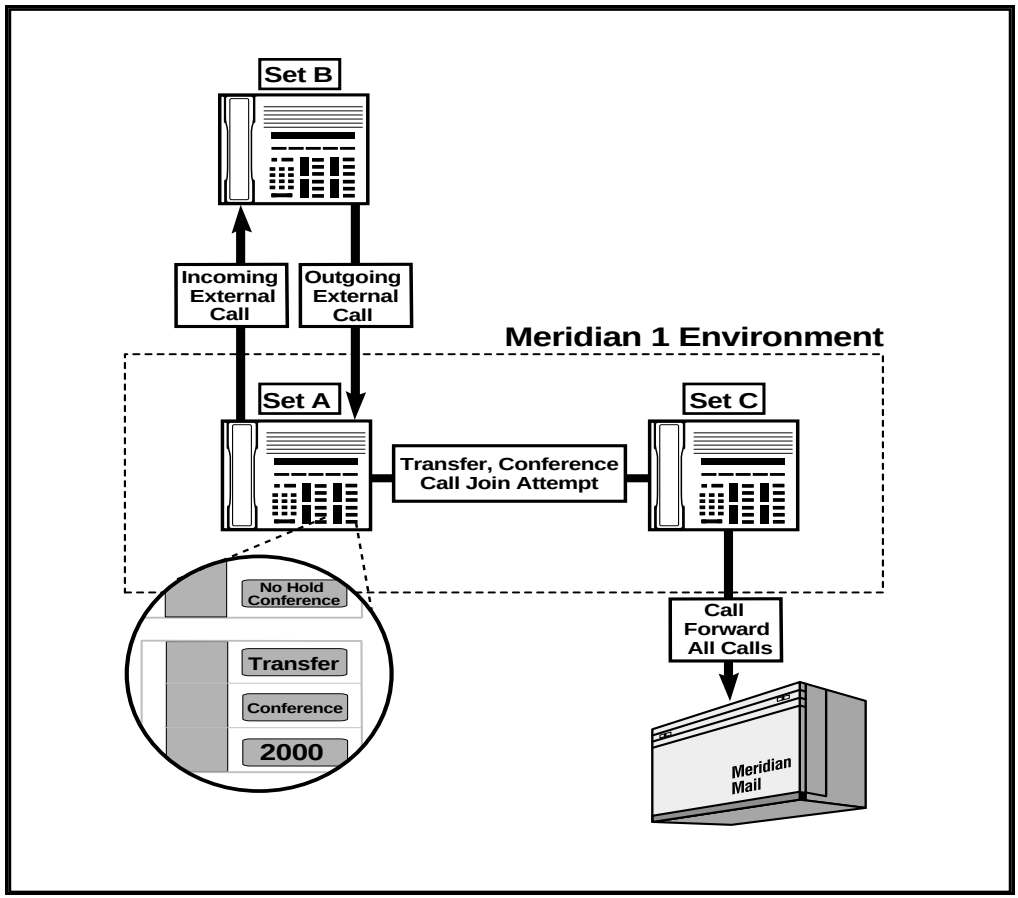
Meridian Mail Trunk Access Restriction averts potential Meridian Mail system abuse by distinguishing between internal and external calls that are directed to Meridian Mail. When activated, Meridian Mail Trunk Access Restriction impacts the operation of the following features:

- Call Transfer
- Conference,
- No Hold Conference, and
- Call Join capabilities of the Multi-Party Operation feature.

Meridian Mail Trunk Access Restriction prevents the completion of any Call Transfer, Conference, No Hold Conference or Call Join attempts on incoming/outgoing external calls to Meridian Mail.

As illustrated in Figure 100, MTAR capabilities prevent an established call between Set A, an internal call, and Set B, an external call, from being forwarded to Meridian Mail. When Set A attempts to either Transfer, Conference, No Hold Conference or Call Join Set B to Set C, which is either a direct Meridian Mail DN or has activated Call Forward All Calls (CFAC) to Meridian Mail, the transfer and conference keys are ignored when pressed to complete operation.

Figure 100
Meridian Mail Trunk Access Restriction Call Transfer



Operating parameters

MTAR does not treat Centralized Attendant Position and Night Attendant sets as Attendant Consoles. These sets receive treatment based on their actual set type. For example, if the night attendant is a Meridian 1 proprietary set, then it is treated as Meridian 1 proprietary set.

The operation of an Attendant Console is not affected when this feature is enabled. An attendant can transfer or conference an external line to Meridian Mail directly or indirectly.

MTAR does not affect Automatic Attendant, Customer Controller Routing, Integrated Voice Response or Meridian Link features. However, if a user disallows any of these features from accessing Meridian Mail, the application must be written to take this into account.

Call transfer from ISDN Basic Rate Interface (BRI) set is not supported.

In a networking environment, Meridian Mail must reside on the same node as the transferring/conferencing set.

Feature interactions

Traffic Reporting

Traffic Reporting and Meridian Administration Tool's (MAT) traffic report, TFC005, are modified to report the number of times this feature is requested. A new line is added for the Meridian Mail Trunk Access Restriction which is identified by the feature number "27" and its peg count.

Network Call Transfer
Network Call Conference

Meridian Mail Trunk Access Restriction (MTAR) requires the transferring or conferencing set and Meridian Mail to be located on the same node. If the transferring or conferencing set are located not on the same node as Meridian Mail, the MTAR feature is not provoked because the call transfer/ conference attempt is terminated by a network on Meridian Mail.

However, an external call can be transferred or conferenced over the network, using TIE trunks. This operation is dependant on the type of network information the remote node forwards to the node where the transfer/conference attempt is made. Meridian Mail must be on the transferring/conferencing node. If network information is provided, indicating that an external call is attempting to transfer/ conference to Meridian Mail, the MTAR feature is invoked. When no network information is provided, MTAR is provoked if the local information (Route Class) indicates that an external call to Meridian Mail is being attempted.

Feature packaging

Meridian Mail Trunk Access Restriction requires Message Waiting Center (MWC) package 46.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 15 – Enable Meridian Mail Trunk Access Restriction.

Meridian Mail Trunk Access Restriction feature requires prior installation of Meridian Mail. The implementation of this feature, therefore, assumes that Meridian Mail has been properly configured.

LD 15 – Enable Meridian Mail Trunk Access Restriction.

Prompt	Response	Description
REQ:	CHG	Change.
TYPE:	FTR	Customer Features and Options.
CUST	xx	Customer number.
- OPT	MCI	Message Centre Included.
...		
- MTAR	YES	Meridian Mail Trunk Access restricted. NO = Meridian Mail Trunk Access allowed.

Feature operation

Call Transfer/Conference

Meridian 1 Proprietary Set

Set A is a Meridian 1 proprietary set with Transfer Key and Conference Key.

1 An incoming/outgoing external call is established between Set A and Set B, an external party. The call between Set A and Set B is active on Key X.

2 Set A presses the Transfer/Conference Key that automatically puts Set B on Hold.

3 Set A dials Set C. Set C has either Call Forward All Calls to Meridian Mail or is a Meridian Mail DN.

4 When Set A attempts to transfer/conference Set B by pressing more than once the Transfer/Conference Key it is ignored.

5 Set A recovers Set B by pressing Key X.

No Hold Conference

Meridian 1 Proprietary Set/ISDN BRI Set

When Meridian Mail Trunk Access Restriction is enabled, direct or indirect no hold conference to an external call is permitted. During direct or indirect no hold conference, the calling party is never put on hold.

Set A is a Meridian 1 proprietary set or an ISDN BRI set with a No Hold Conference Key configured as either No Hold Conference, Conference Autodial, Conference Speed or Conference Hotline.

1 An incoming/outgoing external call is established between Set A and Set B, an external party. The call between Set A and Set B is active on Key X.

2 Set A presses the No Hold Conference Key.

3 Set A dials Set C. Set C is has either Call Forward All Calls to Meridian Mail enabled or is a Meridian Mail DN.

4 The conference is set up as normal. However a two party connection between Set B, an external party, and Meridian Mail is not allowed if the call controller releases. If this occurs, the connection between the trunk and Meridian Mail party is dropped.

Transfer
Analog (500/2500 type) Set

Set A is an Analog (500/2500 type) set with a XFA Class of Service (transfer and three/six party conference allowed).

1 An incoming or outgoing external call is established between Set A and Set B, an external party.

2 Set A performs a switchhook flash that puts Set B on hold.

3 Set A dials Set C. Set C has either Call Forward All Calls to Meridian Mail enabled or is a Meridian Mail DN.

4 Before or after the Meridian Mail has answered, Set A attempts to transfer Set B to Meridian Mail by going on-hook.

5 This attempt is treated as an illegal transfer. Set A is re-rung and reconnected with Set B when going off-hook.

Conference
Analog (500/2500 type) Set

Set A is an Analog (500/2500 type) set with a XFA Class of Service (transfer and three/six party conference allowed).

1 An incoming or outgoing external call is established between Set A and Set B, an external party.

2 Set A performs a switch hook flash that puts Set B on hold.

3 Set A dials Set C. Set C has either Call Forward All Calls to Meridian Mail enabled or is a Meridian Mail DN.

4 Before or after the Meridian Mail has answered, Set A attempts to conference Set B to Meridian Mail by performing another switchhook flash.

5 The conference is not permitted. Set A is reconnected to Set B. The call to Meridian Mail is disconnected.

Set A is an Analog (500/2500 type) set with a TSA Class of Service (three party service allowed).

1 An incoming or outgoing external call is established between Set A and Set B, an external party.

2 Set A perform a switch hook flash that puts Set B on hold.

3. Set A dials Set C. Set C has either Call Forward All Calls to Meridian Mail enabled or is a Meridian Mail DN.
4. Before or after Meridian Mail has answered, Set A attempts to conference Set B to Meridian Mail by dialing the conference control digits.
5. The conference is not permitted and Set A is reconnected to Set B. The call to Meridian Mail is disconnected.

Table 83 summarizes how different external calls are handled when Meridian Mail Trunk Access Restriction is enabled.

Table 83
Summary of Meridian Mail Trunk Access Restrictions

Telephone	External Call Type	Operation	Failure Treatment	Result
500/2500	Incoming	Transfer to Meridian Mail (MMail)	Re-ring to transferring set	Not allowed
500/2500	Incoming	Transfer to set with Call Forward All Calls (CFAC) to MMail	Re-ring to transferring set	Not allowed
500/2500	Outgoing	Transfer to MMail	Disconnect external call and Meridian Mail	Not allowed
500/2500	Outgoing	Conference to set with CFAC to MMail	Disconnect external call and Meridian Mail	Not allowed
500/2500	Outgoing/ Incoming	Conference to MMail	Reconnect to external call. Disconnect call to MMail	Not allowed
500/2500	Outgoing/ Incoming	Conference to set with CFAC to MMail	Reconnect to external call. Disconnect call to MMail	Not allowed
Meridian 1 Proprietary	Outgoing/ Incoming	Transfer/Conferenc e to MMail	Operation ignored	Not allowed

Table 83
Summary of Meridian Mail Trunk Access Restrictions

Meridian 1 Proprietary	Outgoing/ Incoming	Transfer/Conference to set with CFAC to MMail	Operation ignored	Not allowed
Meridian 1 Proprietary	Outgoing/ Incoming	No Hold Conference to Meridian Mail or to set CFAC to MMail	Not applicable	Allow
Meridian 1 Proprietary	Outgoing/ Incoming	No Hold Conference release to make MMail to trunk two-party connection	Disconnect MMail and external trunk	Not allowed
Meridian 1 Proprietary	Outgoing/ Incoming	Call Join of external call to MMail	Operation ignored	Not allowed
Basic Rate Interface	Outgoing/ Incoming	Conference to MMail	Operation ignored	Not allowed
Basic Rate Interface	Outgoing/ Incoming	Conference to set with CFAC to MMail	Operation ignored	Not allowed
Attendant	Outgoing/ Incoming	Transfer/Conference to Meridian Mail	Not Applicable	Allowed
Attendant	Outgoing/ Incoming	Transfer/Conference to set with Call Forward All Calls to Meridian Mail	Not Applicable	Allowed

Message Waiting Indication Interworking with DMS

Contents

The following are the topics in this section:

Feature description 1251
Operating parameters 1253
Feature interactions 1254
Feature packaging 1255
Feature implementation 1257
Task summary list 1257
Feature operation 1263

Feature description

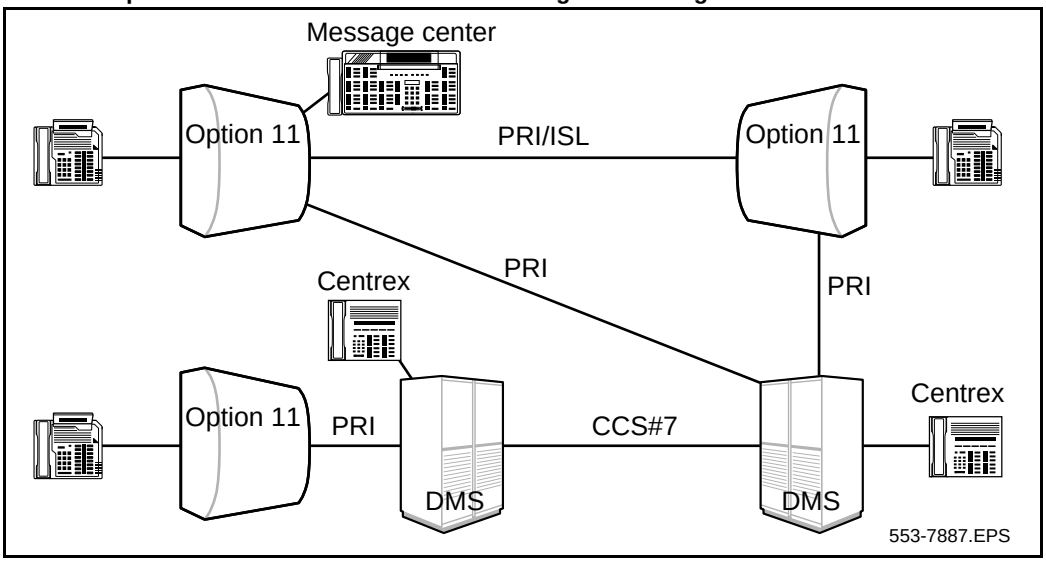
This interworking feature allows a Message Center on either a Meridian 1 or DMS-100 (Centrex) to exchange Message Waiting Indicator information with telephones serviced by either type of system on the network. Calls redirected to the Message Center can be from private or public network callers on either system. A caller served by Meridian 1 can use the Message Center on DMS. A caller served by DMS can use the Message Center (Meridian Mail) on Meridian 1. The Meridian 1 must use a Meridian Mail as its Message Center.

MWI uses the non-call associated Facility messages on ISDN PRI for transporting the TCAP information.

The Meridian 1 and DMS systems can be connected directly or in tandem to whichever system hosts the Message Center. When a caller from either system leaves a message on either system, the Message Waiting Indicator is activated. When the receiver retrieves the message, the Message Waiting Indicator is deactivated. The indicator is either a visual LED (light emitting diode), an icon, or an audible tone in the telephone handset.

Figure 101 shows a network in which Meridian 1 hosts the Message Center that serves both Meridian 1 users and users of a DMS-100 in the same customer group.

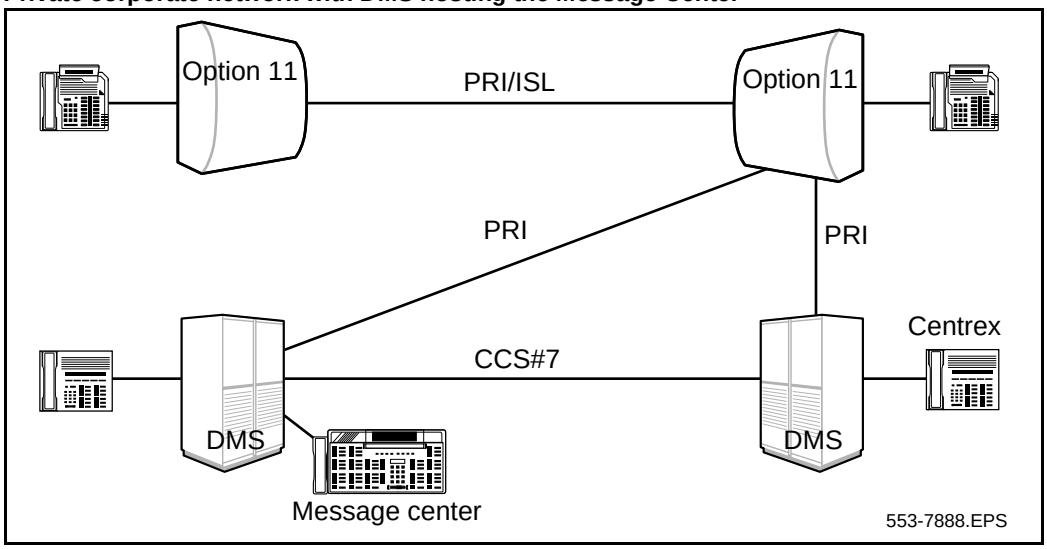
Figure 101
Private corporate network with Meridian 1 hosting the Message Center



Note: CCS#7 is not supported by the Meridian 1; CCS#7 must be a DMS-to-DMS configuration.

Figure 102 shows a network in which DMS hosts the Message Center that serves both Meridian 1 users and DMS users in the same or different enterprise groups.

Figure 102
Private corporate network with DMS hosting the Message Center



Note: CCS#7 is not supported by the Meridian 1; CCS#7 must be a DMS-to-DMS configuration.

Operating parameters

MWI supports DMS-100 and SL-100 as tandem switches, but does not support non-Nortel Networks switches as tandems.

Only Meridian Mail is supported as the Message Center on Meridian 1.

Both DMS-100 and Meridian 1 can transport Facility messages for MWI and can be tandem switches. DMS-100 can tandem Facility messages from Meridian 1 to Meridian 1 for features, such as Call Sender, activated by Meridian 1 users of Meridian Mail. Other Facility messages that DMS-100 can tandem are for updating the voice mail softkeys of an M2317 or M3000 set.

MWI allows public and private numbers for the Original Called Number (OCN) in the Setup message during call forwarding. It also allows public and private numbers for the Directory Numbers (DN) in the ORIG and DEST Information Elements (IE) of the Facility message in order to toggle the MWI Indicator. The OCN refers to the user's mailbox DN. The OCN must be unique in the Meridian Mail database. If the call forwarding DN to the Message Center is a private number, the OCN constructed in the setup message will contain a private number. If the call forwarding DN to the Message Center is a public number, then the OCN constructed in the setup message will contain a public number.

If Meridian Mail is on Meridian 1:

- For Meridian 1 users, Meridian Mail provides the same functions as for the NMS-MM users, if a private number is used.
- For DMS users, some Meridian Mail features may not be available. Contact your local DMS administrator for available Meridian Mail features.

If the Message Center is on DMS:

- If a set on Meridian 1 does not have a DID number, the call forwarding DN to the Message Center should be private. Thus, a set that cannot receive DID calls will still be able to use the Message Center services provided that the DMS Message Center supports private numbers for the mailbox DNs.

End-to-End in-band signaling is required for accessing Message Center features for a local or remote switch.

The call forwarding connection from the caller to the Message Center on another switch must be with ISDN conductivity between Meridian 1 and DMS. This is for passing the OCN from the caller's switch to the switch that hosts the Message Center for leaving voice messages and for transporting TCAP messages to toggle the MWI Indicator.

Feature interactions

Multiple Customer

Serving multiple customers requires multiple Meridian Mail servers. MWI itself does not support multiple customers.

Multi-Tenant Service

Meridian Mail Phase 8 supports Multi-Tenant Service. Tenants from the same customer can use one or more Message Center servers. Tenants from different customers cannot use the same Meridian Mail. The customer controls tenant access to MWI using the sets that belong to the tenant.

Network Message Services, Meridian Mail

Although the Facility message for MWI uses a different TCAP format from that used for NMS, the functions continue to operate.

DCH Error Monitoring

The DCH Error Monitoring monitors ISDN messages on a per feature basis. If the MWI RCAP for the D-channel is added or deleted in LD 17, DCH Error Monitoring will work properly for the NMS feature when the D-channel message monitoring is disabled and then enabled.

Trunk Optimization Before Answer

There is no Trunk Optimization when the call is redirected to DMS or answered by Meridian Mail. This applies to applications such as Auto Attendant.

AML Link Recovery

AML Link Recovery redirects the calls to the ACD queue of the ACD Night Forward DN when the AML link goes down. This recovery is also available for calls in the Meridian Mail ACD queue on Meridian 1 when the AML link goes down.

Feature packaging

The package requirements for Message Waiting Indication (MWI) are different for each node. The following packages are required for an MWI originating node:

- End-to-End Signaling (EES) package 10;
- Basic ACD (BACD) package 40;
- ACD package A (ACDA) package 45;
- Message Center (MWC) package 46;
- ISDN Signaling (ISDN) package 145;

- ISDN Primary Rate Access(PRI) package 146 **or** ISDN Signaling Link (ISL) package 147 (for Meridian 1 to Meridian 1);
- ISDN Network Service (NTWK) package 148;
- Network Message Service (NMS) package 175; and
- Message Waiting Indication (MWI) package 219 (if connected to DMS for interworking);

  Note: Packages 40 and 45 are required only if ACD is used as the Message Center DN.

The following packages are also necessary:

- End-to-End Signaling (EES) package 10;
- Integrated Message Service (IMS) package 35;
- Basic ACD (BACD) package 40;
- ACD package A (ACDA) package 45;
- Message Center (MWC) package 46;
- Command Status Link (CSL) package 77;
- ISDN Signaling (ISDN) package 145;
- ISDN Primary Rate Interface (PRI) package 146 **or** ISDN Signaling Link (ISL) package 147 (for Meridian 1 to Meridian 1);
- ISDN Network Service (NTWK) package 148;
- Network Message Service (NMS) package 175; and
- Message Waiting Indication (MWI) package 219 (if connected to DMS for interworking);

The following packages are required for an MWI tandem node:

- ISDN Signaling (ISDN) package 145;
- ISDN Primary Rate Access (PRI) package 146; or
- 2.0 Mb Primary Rate Interface (PRI2) package PRI2; or
- ISDN Signaling Link (ISL) package 147 (for Meridian 1to Meridian 1);
- ISDN Network Service (NTWK) package 148;

- Message Waiting Indication (MWI) package 219 (if connected to DMS for interworking);

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 17 – Configure remote D-channel capability.

2 LD 15 – Enable Message Service.

3 LD 23 – Configure an ACD Group for the Message Center users in the remote switch.

4 LD 11 – Define the ACD Group as the Message Center DN for each telephone.

5 LD 15 – Configure AC2 to insert ESN Access Code and PNI.

6 LD 16 – Configure PNI and INAC or INST.

7 LD 90 – Configure Home Location Code.

8 LD 90 – Configure Home NPA.

9 LD 90 – Configure Central Office Translation.

LD 17 – Configure remote D-channel capability.

Prompt	Response	Description
REQ	CHG	Change system data.
TYPE	CFN	Configuration record.
- ADAN	CHG DCH x	Change Primary D-Channel. x = 0-63
...		
- RLS	xx yy	Release ID of the switch at the far end of the D-channel interface (xx = Meridian 1, yy = DMS).
- RCAP	MWI XMWI	Add remote D-channel capabilities for MWI Remove remote D-channel capabilities for MWI

If the Message Center is on a Meridian 1, it must be a Meridian Mail. No other messaging devices are supported for the Meridian 1.The DMS may use Meridian Mail or other messaging devices (Octel) for its Message Center.

LD 15 – Enable Message Service.

Prompt	Response	Description
REQ:	CHG	Change.
TYPE:	IMS	Integrated Message Service data.
CUST	xx	Customer number.
- IMS	YES	Change Integrated Message System.
- IMA	YES	Enable Integrated Message System.

LD 23 – Configure an ACD Group for the Message Center users in the remote switch.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	ACD	Automatic Call Distribution.
CUST	xx	Customer number.
ACDN	xxxx	ACD Directory Number.
MWC	YES	ACD DN Message Center DN.
NCFW	xx … xx	Message Center DN: — a public DN (10 digits) prefixed by an ESN Access Code. — an ESN number prefixed by an ESN Access Code Do not define an agent for this ACD group to allow for the automatic call redirection to the ACD Night Call Forward DN where the Message Center DN is defined.

LD 11 – Define the ACD Group as the Message Center DN for each telephone.

Prompt	Response	Description
REQ:	CHG	Change.
TYPE:	xxxx	Type of set.
...		
FDN	x..x	Flexible call forward No Answer to Message Center DN
...		
EFD	x..x	Call Forward by Call Type—External No Answer to Message Center DN
EHT	x..x	Call Forward by Call Type—External Hunt to Message Center DN
HUNT	x	Hunt to Message Center DN
KEY	xx MWK x..x	Message Waiting key, where x..x is the Message Center DN.

LD 15 – Configure AC2 to insert ESN Access Code and PNI.

Prompt	Response	Description
REQ:	NEW CHG	Add new data. Change existing data.
TYPE:	NET	Networking Data.
...		
- AC2		Access Code 2. Enter call types (type of number) that use Access Code 2. Multiple call types can be entered. Default is to Access Code 1.
	NPA	E.164 National
	NXX	E.164 Subscriber
	INTL	International

	SPN	Special Number
	LOC	Location code
- ISDN	YES	Change ISDN options
- PNI	1–32700	Customer private identifier—unique to a customer. Within one network, use the same value for PNI in both the Customer Data Block (LD 15) and the Route Data Block (LD 16) in all PBXs.
...		
- HNPA	200- 999 1200- 1999	Home Number Plan Area Code defined in LD 90
- HNXX	100–9999	Prefix for the Central Office
- HLOC	100–999	Home Location Code (NARS)
- LSC	1–9999	1- to 4-digit Local Steering Code established in the Coordinated Dialing Plan (CDP). The LSC prompt only appears if user has a 5- or 6-digit dialing plan.

For ISDN Networking Features, such as NRAG, NMS and MWI, the originating switch must not use the digit manipulation (DMI) to insert the ESN Access Code. The ESN Access Code must be inserted at the terminating/tandem node via the INST prompt if it connects to the DMS in the Public Network.

LD 16 – Configure PNI and INAC or INST.

Prompt	**Response**	**Description**
REQ	NEW CHG	Add new data. Change existing data.
TYPE	RDB	Route Data Block.
...		

- PNI	1–32700	Customer private identifier—unique to a customer. Within one network, use the same value for PNI in both the Customer Data Block (LD 15) and the Route Data Block (LD 16) in all PBXs.
- INAC	(NO) YES	Insert Access Code. Permit an ESN Access Code to be automatically added to an incoming ESN call from a private network. If INAC is YES, the digit insertion option (INST) is bypassed. This prompt only appears if the route type is a TIE trunk.
- INST	(0)–99999999	Digits to be inserted in front of leading digits. Use this prompt if route is used for connection to DMS.

Use “INST” in LD 16 at Meridian 1 location A for incoming tandem/terminating calls. Use “INAC” at Meridian 1 locations B and C. For the Message Center users on M-1, configure Home Location Code and Home NPA to terminate a Facility message from the Message Center, either on M-1 or on DMS to the Message Center user’s switch. The Facility message is for turning on/off the Message Waiting Indicator for the user.

For the private ESN Uniform Dialing Plan, use LD 90 to configure Home Location Code (HLOC).

LD 90 – Configure Home Location Code.

Prompt	**Response**	**Description**
REQ	NEW, CHG	Add, or change.
CUST	xx	Customer number.
FEAT	NET	Network translation tables.
TRAN	AC1 AC2	Access Code 1. Access Code 2.
TYPE	HLOC	Home Location Code.
HLOC	xxx	Home Location Code (3–7 digits).

For the public numbering plan, a 10 digit number (NPA+NXX+XXXX) is used in the ORIG and DEST IE of the Facility message. Use LD 90 to configure Home NPA and Central Office Translation (NXX) to terminate the Facility message onto the Message Center user's DN.

LD 90 – Configure Home NPA.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
CUST	xx	Customer number.
FEAT	NET	Network Translation Tables.
TRAN	AC1 AC2	Access Code 1. Access Code 2.
TYPE	HPNA	Home NPA Translation.
HNPA	xxx	Home NPA.

LD 90 – Configure Central Office Translation.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
CUST	xx	Customer number.
FEAT	NET	Network Translation Tables.
TRAN	AC1 AC2	Access Code 1. Access Code 2.
TYPE	NXX	Central Office Translation.
NXX	xxx	Office code translation.
- RLI	0–255	Route list index.
- SDRR	LDID	Recognized local DID codes.

- - DMI	1–255	Digit manipulation table index. DMI should delete 3 digits.
- LDID	xxx	Local DID number recognized within the NPA and NXX.

Feature operation

MWI performs two basic operations: 1) activates the MWI at the caller's set; 2) deactivates the MWI at the subscriber's telephone. Table 84 shows the sequence that activates the MWI. Table 85 shows the sequence that deactivates the MWI.

Table 84
When MWI is activated

Sequence	Caller	Receiver	Message Center
1	Calls receiver	Receiver not available	
2	Leaves a message		Records caller's message
3	Hangs up		Activates MWI on receiver's set

Table 85
When MWI is deactivated

Sequence	Receiver	Message Center
1	Notices MWI	
2	Calls the Message Center	Plays messages
3	Clears the mailbox	
4	Hangs up	Deactivates MWI on receiver's set

Some of the failures that can occur and how MWI handles those failures are as follows:

- AML/CSL link failure
  If the AML/CSL link fails between Meridian Mail and its host Meridian 1, calls are redirected to the ACD Night Call Forward DN for the ACD queue involved.
- D-channel failure
  If the D-channel is out of service, the Facility message is lost. For Meridian Mail, an MWI CSL message is sent to the Meridian Mail server.
- Inconsistent data base
  If the Facility message that toggles MWI cannot be delivered to the caller's set because the DN is invalid or MWI is not supported in the remote switch, an MWI CSL message is sent to Meridian Mail.

MSDL Idle Code Selection

Contents

The following are the topics in this section:

Regional material statement 1265
Feature description 1265
Operating parameters 1268
Feature interactions 1268
Feature packaging 1269
Feature implementation 1269
Task summary list 1269
Feature operation 1269

Regional material statement

The information presented in this section does not pertain to all market regions. Contact your system supplier or your Nortel Networks representative to verify support of this product in your area.

Feature description

When a T1 carrier is disabled at the remote end, the remote T1 or ISDN PRI hardware raises a “Red Alarm” status and sends a “Yellow Alarm,” to the local (near end) Meridian 1, which takes all trunks and channels out of service, and responds to the remote end by sending an “Unassigned PCM” (FF) code. However, some switches do not recognize the “Unassigned PCM” code, and instead expect an “Idle PCM” (7F) code.

The Idle Code Selection feature allows a Meridian 1, upon receiving a "Yellow Alarm" condition from the remote end with a disabled T1 carrier, to be configured to respond by sending an "Idle PCM" code instead of an "Unassigned PCM" code. Therefore, a remote switch, such as a Lucent 5ESS, which expects to receive an "Idle PCM" code can be cleared of a Red Alarm, the Meridian 1 can be cleared of a Yellow Alarm, and trunks and channels can be brought back into service.

The craftsperson should confirm that the remote end supports the "Idle PCM" code, before configuring this feature on a loop.

The Idle Code Selection is an enhancement to the existing DTI (package 75) and PRA (package 146) packages.

Figure 103 shows the existing operation, where the Meridian 1 responds to the remote end only with an "Unassigned PCM" code. Figure 104 shows the enhancement made by the Idle Code Selection feature, where the Meridian 1 responds with either the "Unassigned PCM" code or the "Idle PCM" code, depending on how the loop has been configured, as described in "Feature implementation" on page 1269.

Figure 103
Meridian 1 response to Yellow Alarm condition prior to Idle Code Selection feature

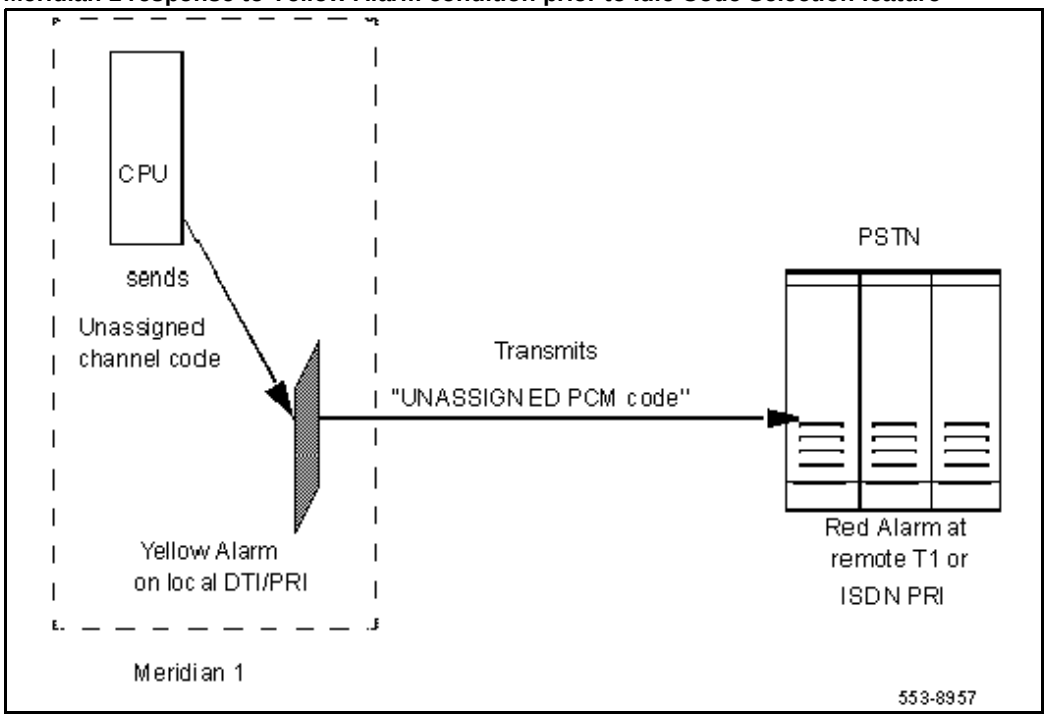
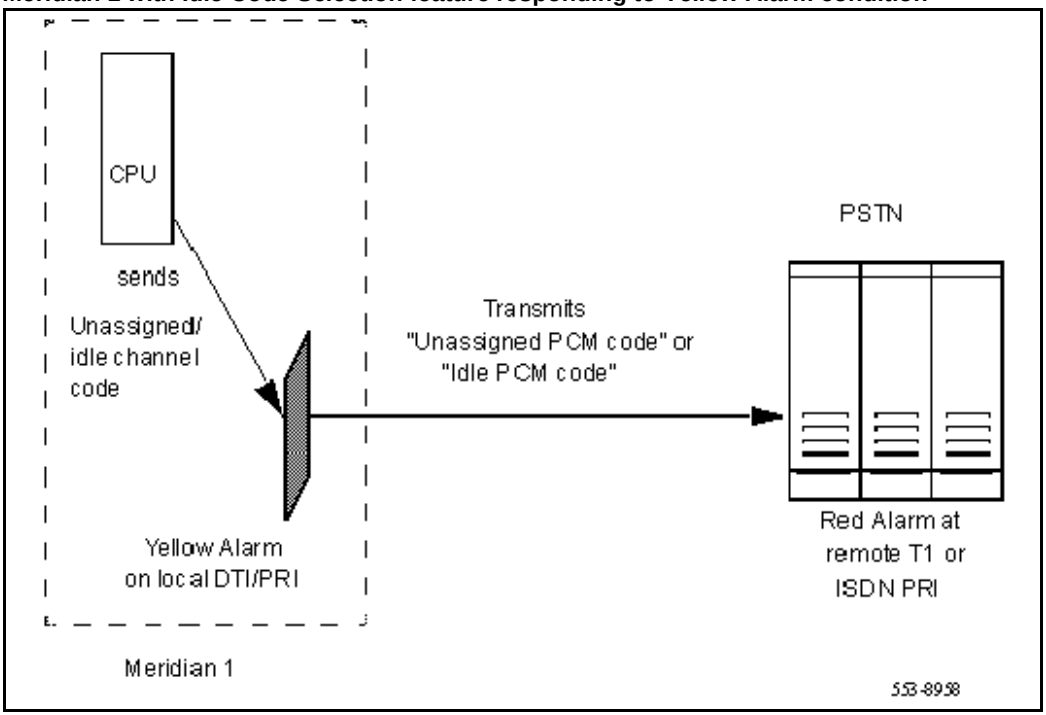


Figure 104
Meridian 1 with Idle Code Selection feature responding to Yellow Alarm condition



Operating parameters

This feature applies to DTI and PRI (1.5 Mb) only and not to DTI2 nor PRI2.

Feature interactions

Idle Code Selection, as an addition to the existing DTI (package 75) or PRA (package 146) packages, does not add any additional feature interactions.

In the following cases, when modifying or deleting loops, a new SCH warning message will be output, indicating that “ICS data associated with the loop is removed.”

- when changing the IFC type of a PRI loop that has ICS data associated with it and,
- when removing a DTI/PRI loop that has ICS data associated with it.

Feature packaging

Idle Code Selection is not a separate package, but is an enhancement to the existing DTI (package 75) and PRA (package 146) packages. Idle Code Selection requires either the DTI or PRA package. ISDN package 145 is required for ISDN.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 73 – Activate (or deactivate) a loop to send “Idle PCM” code.

LD 73 – Activate (or deactivate) a loop to send “Idle PCM” code.

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	DDB	Digital Data Block
...	...	
SRMM	1-(2)-127	Slip Rate Maintenance Maximum.
ICS	xxx	Idle Code Selection loop number. xxx = 0-159 for options 51C, 61C, and 81C. xxx = 0-63 for option 11C.
	(Xnnn)	To deactivate the feature on loop xxx.
...	...	

Feature operation

No specific operating procedures are required to use this feature.

MSDL Status Enquiry Message Throttle

Contents

The following are the topics in this section:

Regional material statement 1271
Feature description 1271
Operating parameters 1272
Feature interactions 1272
Feature packaging 1272
Feature implementation 1273
Task summary list 1273
Feature operation 1274

Regional material statement

The information presented in this section does not pertain to all market regions. Contact your system supplier or your Nortel Networks representative to verify support of this product in your area.

Feature description

When a D-channel recovers from data link failure, in a Meridian 1 to Meridian 1 network interface, the “network” (master) side of the “network” side to “user” (slave) side interface sends a Status Enquiry message to the “user” side, for every established B-channel, to request the call state.

The Status Enquiry Message Throttle feature regulates the sending of Status Enquiry messages, by limiting the Status Enquiry messages sent within a 128 millisecond time period. The Network side of the interface uses a fixed number of Status Enquiry messages that is configurable per D-channel through a Status Enquiry Message Throttle (SEMT) parameter in LD 17.

By reducing the number of Status Enquiry messages sent in a given 128 msec time period, this feature improves the amount of network congestion experienced after a D-channel recovers from data link failure. This also frees up some timeslots for call processing.

By default the SEMT parameter is 1. The valid input range is 1 to 5.

Operating parameters

This feature applies to DTI and PRI (1.5 Mb) only and not to DTI2 nor PRI2.

This feature supports both the NT6D80 Multi-Purpose Serial Data Link (MSDL) card and the NT5D12 Dual Port DTI/PRI card with the Downloadable D-channel daughterboard for DDP (NTBK51AA). ISDN PRI and ISL interfaces are supported.

This feature applies only to Meridian 1 to Meridian 1 interfaces (MCDN inter-networking).

The new prompt, SEMT, only applies to the “network” side interface of the Meridian 1 to Meridian 1 network.

Feature interactions

There are no feature interactions for this feature.

Feature packaging

The following packages are required:

- ISDN Signaling (ISDN), package 145
- ISDN Primary Rate Access (PRA), package 146, or
- ISDN Signaling Link (ISL), package 147
- Multi-Purpose Serial Data Link (MSDL), package 222

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

LD 17 – Configure the Status Enquiry Message Throttle (SEMT) parameter.

LD 17 – Configure the Status Enquiry Message Throttle (SEMT) parameter.

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	CEQU	All input/output devices.
ADAN	aaa DCH xx	Primary D-channel number. Where: aaa = NEW or CHG. xx = 0-63 for options 51C, 61C, and 81C. xx = 1-9 for option 11C.
CTYP	MSDL	Multipurpose Serial Data Link card.
GRP	0-4	Network Group number for Option 81C.
DNUM	0-15	Device number for I/O ports. All ports on the MSDL card share the same DNUM. The MSDL card address settings must match the DNUM value.
CDNO	1-9	For option 11C: card slot number where NTBK51AA Downloadable DCH daughterboard is configured.
PORT	0-3 1	Port number for the MSDL card. For option 11C: default port 1 is printed for the NTBK41AA Downloadable DCH Daughterboard.
USR	PRI	Primary Rate Interface. D-channel for ISDN PRA only.
IFC	SL1	Meridian SL-1 interface.
DCHL	xxx	D-channel PRI loop number. Where: xxx = 0-159 for options 51C, 61C, and 81C. xxx = 1-9 for option 11C.
...	...	

OTBF	1-(32)-127	Output Request Buffer
DRAT		D-channel Transmission Rate
SIDE	NET	Network, the controlling switch.
SEMT	(1)-5	Number of Status Enquiry messages sent within 128 msec from the Network side.
RLS	xx	Release ID of the switch at the remote (far) end of the D-channel.
...	...	

Feature operation

No specific operating procedures are required to use this feature.Table 86 lists commands for getting the status, enabling, and disabling the MSDL card or Downloadable D-channel Daughterboard card.

Table 86
MSDL/Daughterboard card system commands

Command	Response
STAT MSDL xx	Get status of the newly configured MSDL card. Where: • xx = device number (DNUM) entry for newly configured MSDL card. • xx = Card slot number (CDNO) for the NTBK51AA Downloadable DCH Daughterboard. The card status is output and can be any one of the following: MSDL xx: ENBL MSDL xx: MAN DSBL MSDL xx: SYS DSBL reason ***Note:*** The "MSDL xx: SYS DSBL reason" message indicates that maintenance is required by the craftsperson and installation can only continue when reason is corrected. Refer to *LD 48 Alphabetical list of commands* "STAT MSDL (x(FULL))" command for a complete list of reasons.
DIS MSDL xx	Disable the MSDL device if Stat command indicates MSDL is in enabled state.

Table 86
MSDL/Daughterboard card system commands

ENL MSDL xx FDL	Enable the MSDL card. Where: • xx = D-channel number configured in LD 17. Enabling the MSDL card with this command is only permitted if the card is currently in the Manually Disabled state. ***Note:*** A series of dots (".") are output which indicate that software download is in progress. Following the download the card will be enabled.

MSDL Port Overload Counter

Contents

The following are the topics in this section:

Feature description 1277
Operating parameters 1280
Feature interactions 1280
Feature packaging 1281
Feature implementation 1281
Feature operation 1281
Maintenance and Diagnostics 1281
Fault Clearance Procedures 1283
Overloaded MSDL port running a DCH Application 1283
Overloaded MSDL port running an AML Application 1283
Overloaded MSDL port running an SDI Application 1284

Feature description

The MSDL Port Overload Counter feature provides the capability of locking out individual MSDL ports when incoming messages through a port exceed or equal the port overload threshold of 200 messages in a two second time period.

When any of the four ports on the MSDL card reaches the port overload threshold it is locked-out, but the operation of other ports on the MSDL card will not be affected.

The MSDL card is still subject to a card overload threshold, which will cause a lock-out if it receives 300 or more messages per two seconds. However, when an individual MSDL port becomes overloaded, the messages to that port are subtracted from the total card messages used in performing the card overload check. Furthermore, port overload checks have priority over card overload checks.

The overloaded port on the MSDL card is locked-out so that the card stops responding to the incoming messages from the overloaded port. This prevents the Meridian 1 CPU from servicing a very high incoming message rate from the port, which could cause system degradation.

Figure 105 shows the existing MSDL card lockout, while Figure 106 shows the port lockout functionality introduced by the Port Overload Counter feature. Figure 107 demonstrates a port overload check being performed before a card overload check.

Figure 105
MSDL card lock-out

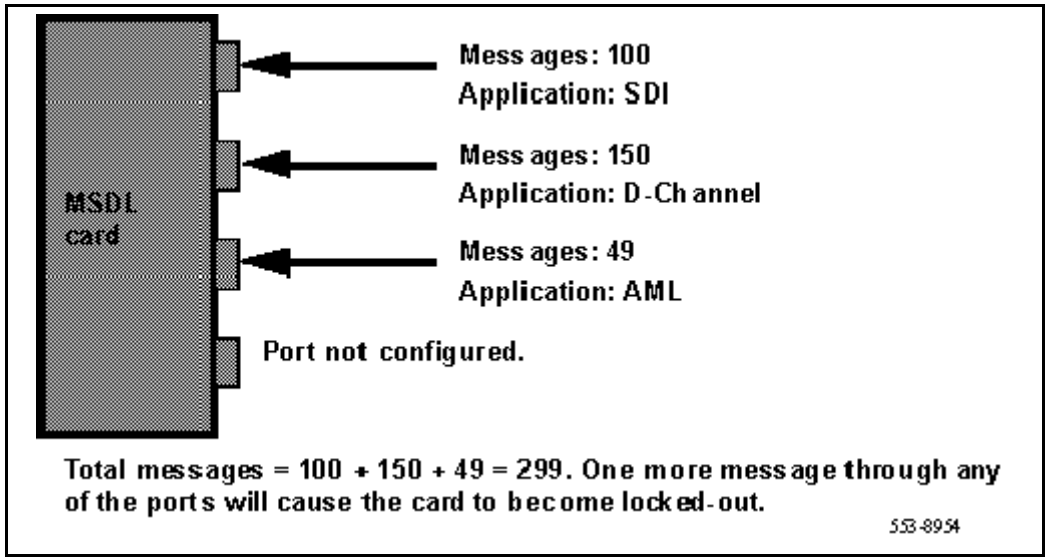

MSDL card
Messages: 100
Application: SDI
Messages: 150
Application: D-Channel
Messages: 49
Application: AML
Port not configured.
Total messages = 100 + 150 + 49 = 299. One more message through any of the ports will cause the card to become locked-out.
553-8954

Figure 106
MSDL port overload check preceding card overload check

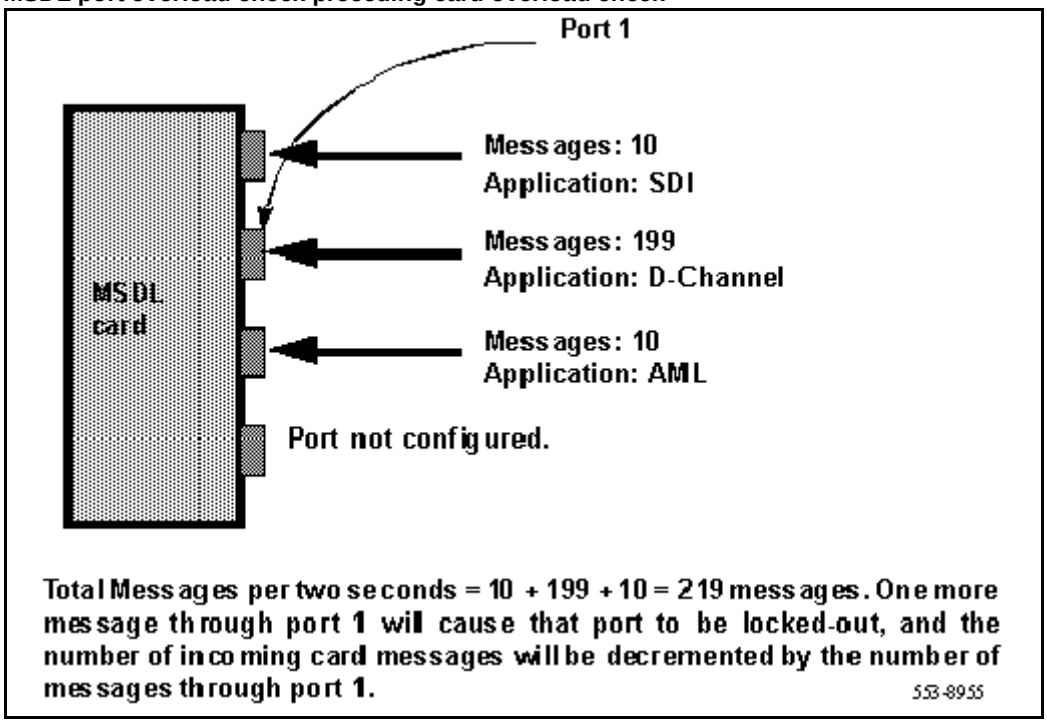
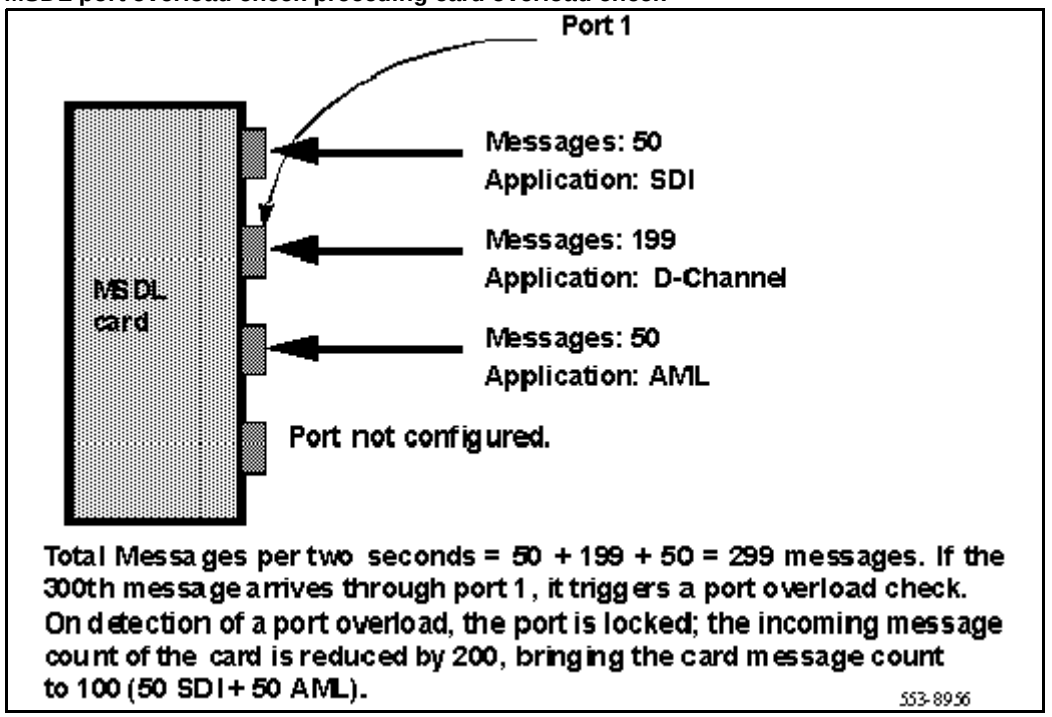

Port 1
Messages: 10
Application: SDI
Messages: 199
Application: D-Channel
MSDL card
Messages: 10
Application: AML
Port not configured.
Total Messages per two seconds = 10 + 199 + 10 = 219 messages. One more message through port 1 will cause that port to be locked-out, and the number of incoming card messages will be decremented by the number of messages through port 1.
553-8955

Figure 107
MSDL port overload check preceding card overload check


Port 1
Messages: 50
Application: SDI
Messages: 199
Application: D-Channel
Messages: 50
Application: AML
MSDL card
Port not configured.
Total Messages per two seconds = 50 + 199 + 50 = 299 messages. If the 300th message arrives through port 1, it triggers a port overload check. On detection of a port overload, the port is locked; the incoming message count of the card is reduced by 200, bringing the card message count to 100 (50 SDI + 50 AML).
553-8956

Operating parameters

There are no operating parameter specified for this feature.

Feature interactions

MSDL/MISP Interface Handler (MMIH)

The MMIH provides a software interface between the MSDL/MISP card and the Meridian 1 software, and allows applications on the MSDL/MISP card to access each other through the interface.

Previously, the interface software maintained a counter of incoming messages on an MSDL application basis. When the sum of all messages received indicated an excessive incoming message rate, the MSDL card was locked-out.

The Port Overload Counter feature modifies the MMIH so that incoming message counters are maintained for individual MSDL ports

This feature changes the functionality of the MMIH for an MSDL card, but the MISP remains unchanged.

DCH/SDI/AML Application

The Port Overload Counter feature changes the DCH/SDI/AML Application to cause the MSDL port to lockout when the incoming messages exceed the Port Overload threshold value.

B-Channel Overload Control (BCOC)

This feature has no interaction with the B-Channel Overload Control Feature.

MISP

This feature does not change the functionality of the MISP card interface.

Feature packaging

The Port Overload Counter feature requires the following package:

- MSDL Card Package, package number 222.

Feature implementation

No change to the existing configuration is required to enable this feature. However, as described in “Maintenance and Diagnostics” on page 1281, modifications have been made to overlay maintenance and diagnostic commands.

Feature operation

No specific operating procedures are required to use this feature. The feature is activated whenever a configured application on an MSDL card is active and is receiving messages through the active port.

Maintenance and Diagnostics

The Port Overload Counter feature has made the following modifications to overlay maintenance and diagnostic commands:

LD 37 - I/O Diagnostic

Commands	System Responses	Description
STAT MSDL xx (Where xx = physical MSDL number)	MSDL xx: ENBL SDI 7 **OVLD** PORT 0 DCH 11 **OVLD** PORT 1 AML 12 **OVLD** PORT 2	Display the status of ports on a card. The status includes overloaded ports.
STAT TTY xx (Where xx = logical SDI number)	TTY xx: **OVLD**	Display the status of an overloaded MSDL port running an SDI application.
ENL TTY xx Where xx = logical SDI number)	IOD_xxx	Failed to enable the SDI on MSDL port xx. Refer to "Overloaded MSDL port running an SDI Application" on page 1284.

LD 48 - Link Diagnostic

Commands	System Responses	Description
STAT MSDL xx (Where xx = physical MSDL number)	MSDL xx: ENBL SDI 7 **OVLD** PORT 0 DCH 11 **OVLD** PORT 1 AML 12 **OVLD** PORT 2 (Where xx = physical MSDL number)	Display the status of ports on a card. The status includes overloaded ports.
STAT AML aa (Where xx = logical AML number)	AML: xx MSDL: yy PORT: zz DES: LYR2: **OVLD** (Where xx = logical AML number, yy = physical MSDL number, and zz = MSDL port)	Display the status of an overloaded MSDL port.
ENL AML xx (Where xx = logical AML number)	CSA_xxx	Failed to enable AML link. Refer to "Overloaded MSDL port running an AML Application" on page 1283.

LD 96 - PRI D Channel Diagnostic

Commands	System Responses	Description
STAT MSDL xx (Where xx = physical MSDL number)	SDI 7 **OVLD** PORT 0 DCH 11 **OVLD** PORT 1 AML 12 **OVLD** PORT 2	Display the status of ports on a card. The status includes overloaded ports.
STAT DCH xx (Where xx = logical D Channel number)	DCH xx: **OVLD** DES:	Display the status of an overloaded MSDL port running a D Channel Application.
ENL DCH xx (Where xx = logical D Channel number)	DCH_XXX	Failed to enable the D Channel. Refer to “Overloaded MSDL port running a DCH Application” on page 1283.

Fault Clearance Procedures

Overloaded MSDL port running a DCH Application

Cause: The Meridian 1 received an excessive number of messages (equal to or greater than 200 messages in a two second time period) from the MSDL port.

To clear the fault: Manually disable the D-Channel in Overlay 96 using the command DIS DCH xx, where xx is the D-Channel number. Enable the D-Channel using Overlay 96 using the command ENL DCH xx.

Overloaded MSDL port running an AML Application

Cause: The Meridian 1 received an excessive number of messages (equal to or greater than 200 messages in a two second time period) from the MSDL port.

To clear the fault: Manually disable the AML Link in Overlay 48 using the command DIS AML xx, where xx is the AML Link number. Enable the AML Link using Overlay 48 using the command ENL AML xx.

Overloaded MSDL port running an SDI Application

Cause: The Meridian 1 received an excessive number of messages (equal to or greater than 200 messages in a two second time period) from the MSDL port. One scenario of the overloaded SDI port is the case of a smart-modem setup for “smart” vs. “dumb” mode. The Meridian 1 and the modem may be bouncing the same messages back and forth until the 200 port message threshold is reached.

To clear the fault: Manually disable the link in Overlay 37 using the command DIS TTY xx, where xx is the SDI number. Enable the AML Link using Overlay 37 using the command ENL TTY xx.

National ISDN 2 TR-1268 Primary Rate Interface

Contents

The following are the topics in this section:

Regional material statement 1285
Feature description 1285
Operating parameters 1287
Feature interactions 1287
Feature packaging 1287
Feature implementation 1288
Task summary list 1288
Feature operation 1289

Regional material statement

This feature is only available in North America. Contact your system supplier or your Nortel Networks representative to verify support of this product in your area.

Feature description

The National ISDN-2 TR-NWT-001268 Primary Rate Interface (PRI) feature provides an Integrated Services Digital Network (ISDN) PRI interface to the Public Exchange/Central Office that conforms to portions of the National ISDN-2 (NI-2) specification as developed by the National ISDN users Forum (NIUF) and documented in Bellcore Specification TR-1268.

The Meridian 1 supports the following call services on the NI-2 interface:

- Basic call service
- Circuit-mode bearer capabilities (speech, 3.1 kHz audio, 64 kbps digital, and adapted 56 kbps to 64 kbps digital)
- Enbloc sending
- Channel negotiation
- In-band tone and announcement
- Calling number delivery
- Calling Party Number Privacy, using the Calling Party Name feature (*67)
- A back-up D-channel is provided to improve the reliability of an ISDN PRI interface that consists of more than one Digital Signal Level 1 (DS1) facility. The primary and back-up D-channels reside on the 24th channel of separate DS1 facilities. Both D-channels provide signaling information for the interface, but only one can be in service at any given time.

The Meridian 1 does not support the following TR-1268 functionalities:

- Packet Mode Unrestricted Digital Information bearer capability
- Circuit Mode Unrestricted Digital Information at n x 64 kbps, H_0 and H_{11} channels bearer capability (due to the lack of hardware support of providing contiguous timeslots)
- Up to two Calling Party Number information elements for terminating calls
- Up to two redirecting numbers provided for originating and terminating calls
- Subaddressing
- Calling party number privacy on subscription basis
- Call-by-Call Service Selection, and
- Switched DS1/Switched Fractional DS1 Service.

Operating parameters

The existing Network Call Redirection limitation on unsupported interface applies to the NI-2 interface. The Meridian 1 NI-2 interface generates the Redirecting Number (RN) Information Element (IE) of the most recent instance of redirection of an internal call forward call. If the Meridian 1 receives an RN IE at the NI-2 interface, it passes it along. If there are more than one RN IEs, the later ones are treated as duplicates and are discarded.

A maximum of 16 DS1 loops can be supported when both the primary and backup D-channels are configured (i.e., 16 x 24 - 2 = 382 B-channels); however, the Meridian 1 is limited to 254 trunks in a single route. Stepping to a second route is permitted only if the Meridian 1 is supported by a far end switch.

The ISDN NI-2 TR-1268 PRI feature requires a DTI/PRI card and a D-channel Handler card.

Feature interactions

Integrated Service Access (ISA)

Integrated Service Access is not supported on this interface.

ISDN Signaling Link (ISL)

ISDN Signaling Link is not supported on this interface.

Feature packaging

The ISDN NI-2 TR-1268 PRI Basic Call feature is contained in North American National ISDN Class II Equipment (NI2) package 291.

The following packages are also required to activate this feature:

- Integrated Services Digital Network (ISDN) package 145
- 1.5 Mb Primary Rate Access (PRA) package 146;
- Multi-purpose Serial Data Link (MSDL) package 222.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 17 – Configure the primary D-channel.

2 LD 17 – Configure the backup D-channel.

3 LD 16 – Use this overlay to define a route data block (for ISDN PRI).

The following two service changes are required for this feature: define a new interface type for a given D-channel; and define the download.

LD 17 – Configure the primary D-channel.

Prompt	Response	Description
REQ	NEW CHG	Add or change configuration information.
TYPE	CFN	Configuration Record.
ADAN	NEW CHG OUT DCH xx	Add, change, or remove primary D-channel.
CTYP	MSDL	Supported only on Multi-purpose Serial Data Link (MSDL) or Downloadable D-channel cards.
...		
USR	PRI	D-channel mode.
IFC	NI2	NI-2 TR-1268 interface type.
CO_TYPE	(STD) ATT	Central Office switch type (prompted only if IFC = NI2). STD = Totally compatible with Bellcore standard. ATT = AT&T 5ESS.
PRI	lll nn	lll = PRI loop using the same D-channel (0,1,...159) nn = Interface identifier (2,3,...15)
...		

LD 17 – Configure the backup D-channel.

Prompt	Response	Description
REQ	NEW CHG	Add or change configuration information.
TYPE	CFN	Configuration Record.
ADAN	NEW CHG OUT BDCH yy	Add, change or remove backup D-channel data.
PDCH	xx	Associated primary D-channel.
CTYP	MSDL	Card type.
...		

LD 16 – Use this overlay to define a route data block (for ISDN PRI).

Prompt	Response	Description
REQ	NEW CHG	New or change.
TYPE	RDB	Route data block.
...		
DGTP	PRI	Digital route type.
IFC	NI2	New DCH interface ID.
...		

Feature operation

No specific operating instructions are required to use this feature.

Network ACD

Contents

The following are the topics in this section:

Feature description 1291
Operating parameters 1292
Feature interactions 1292
Feature packaging 1292
Feature implementation 1293
Feature operation 1293

Feature description

Network ACD allows call centers with multiple locations to solve the problem of fluctuating call traffic. The Network ACD feature uses Integrated Services Digital Network (ISDN) to efficiently and quickly route calls to available agents within a network of Meridian 1 systems. Using the timed overflow routing tables associated with ACD, customers can specify ACD-DNs within the Meridian 1 network to which calls should be directed.

NACD is cost effective because calls remain in queue at their original location while waiting for an agent to become available in either the source queue or one of the target queues located throughout the network. Only when an agent becomes available in a remote queue will the call actually be sent over an ISDN voice channel. Prior to the call being sent, communication between locations is handled via the ISDN D-Channel.

The management report information on package C reflects the changes introduced by the NACD feature.

ACD-MAX supports the NACD feature. Three new reports and three additional management displays are provided to allow customers to determine call traffic patterns and service levels throughout the network. Centralization of this information will be provided with the introduction of the Network Administration Center. Network Administration Center requires an ACD-MAX in each network location and provides reports and displays on the entire NACD environment.

For correct display on ACD-MAX, NACD supports only a UDP numbering plan. CDP will be supported at a later date. It is important to note that the system regular users can operate using one dialing plan (i.e. CDP or UDP) while the NACD operates using another numbering scheme (i.e. UDP with location codes).

Operating parameters

Option 11C systems only support Meridian ACD-MAX.

This feature is currently incompatible with the similar Network ACD feature on the SL-100.

NACD is not supported on Package D, PDP 11 - Generic 9000 software.

Feature interactions

There are no feature interactions associated with this feature.

Feature packaging

This feature requires Network Automatic Call Distribution (NACD) package 207. The following packages are also required:

- Basic Routing (BRTE) package 14;
- Digit Display (DDSP) package 19;
- Basic Queuing (BQUE) package 28;
- Network Class Of Service (NCOS) package 32;
- Network Signaling (NSIG) package 37;
- Basic Automatic Call Distribution (BACD) package 40;
- Automatic Call Distribution, Package B (ACDB) package 41;

- Automatic Call Distribution, Package A (ACDA) package 45;
- Automatic Answerback (AAB) package 47;
- Network Alternate Route Selection (NARS) package 58; or
- Coordinated Dialing Plan (CDP) package 59;
- Flexible Call Back Queuing (FCBQ) package 61;
- 1.5 Mb Digital Trunk Interface (PBXI) package 75; or
- 2.0 Mb Digital Trunk Interface (PBXI) package 129
- Timed Overflow Queuing (TOF) package 111;
- Integrated Services Digital Network (ISDN) package 145;
- International Primary Rate Access (PRI) package 146; or
- 2.0 Mb Primary Rate Access (PRI2) package 154; or
- ISDN signaling Link (ISL) package 147;
- Advanced ISDN Network Services (NTWK) package 148;
- ACD Enhanced Overflow (EOVF) package 178.

Feature implementation

There are no specific implementation procedures for this feature.

Feature operation

No specific operating procedures are required to use this feature.

Network and Executive Distinctive Ringing

Contents

The following are the topics in this section:

Feature description 1295
Operating parameters 1296
Feature interactions 1296
Feature packaging 1297
Feature implementation 1297
Task summary list 1297
Feature operation 1300

Feature description

Network Distinctive Ringing (NDRG) allows a distinctive ringing cadence to be configured throughout a Meridian network. Distinctive ringing is defined on a route basis. There are four NDRG distinctive ringing cadence indices that can be defined for a route. These indices are contained in the Flexible Tone and Cadences (FTC) table. If one of these indices has been defined for a route and an incoming trunk call over that route terminates on the local node, the terminating set receives distinctive ringing. If the incoming call tandems to another node via an Integrated Services Digital Network (ISDN) TIE trunk, the terminating set at the terminating node receives distinctive ringing. This occurs if the TIE trunk has been marked as distinctive and if the NDRG feature is equipped at the terminating node; otherwise, normal ringing is given.

Executive Distinctive Ringing applies to both network and stand-alone environments. This feature allows a Class of Service to be entered for a telephone set, marking the set as “executive”. When a call is made from an executive set, the called set is rung distinctively. This feature uses the distinctive cadences introduced by the Network Distinctive Ringing (NDRG) feature.

One of five Classes of Service can be entered – EXR1, EXR2, EXR3, EXR4, or EXR0. EXR is the Class of Service mnemonic that marks the set as executive, and the digits one to four indicate which of the four distinctive ringing cadences is to be applied. EXR0 is the default; it marks a set as normal.

Operating parameters

Both Network Distinctive Ringing and Executive Distinctive Ringing may be equipped for a set. In this case, a cadence that is selected for NDRG may also be selected for EDRG.

Within a network, if there are five routes marked as distinctive, and if an incoming call tandems between two nodes that are connected by a single TIE trunk, the terminating node can provide unique distinctive ringing for only four of the five routes. The originating node can provide unique distinctive ringing to all five routes since each route can use a different Flexible Tone and Cadence (FTC) table.

Feature interactions

Incoming trunk

An incoming trunk call that is redirected or attendant-extended will ring distinctively at the terminating set, according to the cadence index of the originating trunk route. If the terminating set is located at another node, it will ring distinctively according to the cadence index of the originating trunk route (if the NDRG feature is equipped at the terminating node).

Buzz

Network Distinctive Ringing and Executive Distinctive Ringing do not affect the buzzing of a set.

Conference

If a new party is to be included in an established conference, the ringing that is applied to the set of the new party depends on the sets of the established parties. The system scans the trunks and sets of the conferees for a trunk marked as distinctive or a set designated as executive. The ringing cadence of the new set depends on the highest index found by the scan.

Feature packaging

The following packages are required for Network and Executive Distinctive Ringing:

- Distinctive Ringing (DRNG) package 74;
- Flexible Tones and Cadences (FTC) package 125;
- Integrated Services Digital Network (ISDN) package 145;
- Integrated Services Digital Network Supplementary Features (ISDNS) package 161;
- Executive Distinctive Ringing (EDRG) package 185.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 10 – Define the distinctive ringing cadence for analog (500/2500 type).

2 LD 11 – Define the distinctive ringing cadence/tone to be used for Meridian digital sets.

3 LD 16 – Deny or allow Distinctive Ringing and define Network Ring Index.

4 LD 56 – Define Flexible Tones and Cadences.

LD 10 – Define the distinctive ringing cadence for analog (500/2500 type).

Prompt	Response	Description
REQ:	CHG	Change.
TYPE:	500	Type of set.
TN	l s c u	Terminal Number.
	c u	For Option 11.
...		
CLS	(EXR0) EXR1 EXR2 EXR3 EXR4	Executive Distinctive Ringing Off 0. Executive Distinctive Ringing On 1. Executive Distinctive Ringing On 2. Executive Distinctive Ringing On 3. Executive Distinctive Ringing On 4.

LD 11 – Define the distinctive ringing cadence/tone to be used for Meridian digital sets.

Prompt	Response	Description
REQ:	CHG	Change.
TYPE:	aaaa	Type of set.
TN	l s c u	Terminal Number.
	c u	For Option 11C.
...		
CLS	(EXR0) EXR1 EXR2 EXR3 EXR4	Executive Distinctive Ringing Off (0). Executive Distinctive Ringing Tone 1. Executive Distinctive Ringing Tone 2. Executive Distinctive Ringing Tone 3. Executive Distinctive Ringing Tone 4.

LD 16 – Deny or allow Distinctive Ringing and define Network Ring Index.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	RDB	Route Data Block.
CUST	xx	Customer number.
ROUT	xxx	Route Number.
TKTP	aaa	Trunk Type.
...		
DRNG	(NO) YES	Deny or allow Distinctive Ringing.
NDRI	(0)-4	Define the Network Distinctive Ringing Index.

LD 56 – Define Flexible Tones and Cadences.

Prompt	Response	Description
REQ	NEW CHG	New, or change.
TYPE	FTC	Flexible Tones and Cadences data block.
TABL	0-31	FTC Table number.
USER	(NO) YES	Print users of this table and tone table values (tone table value only).
DFLT	0-31	Default to existing FTC tone table.
RING	(NO) YES	Change the ringing feature definitions.
...		
- NDR1 PBX	0-255	Network Distinctive Ring 1 cadence for analog (500/2500 type) sets.
- NDR1 BCS		Network Distinctive Ring 1 for BCS Meridian 1 digital sets.
- NDR2 PBX	0-255	Network Distinctive Ring 2 cadence for analog (500/2500 type) sets.

- NDR2 BCS		Network Distinctive Ring 2 for BCS Meridian 1 digital sets.
- NDR3 PBX	0-255	Network Distinctive Ring 3 cadence for analog (500/2500 type) sets.
- NDR3 BCS		Network Distinctive Ring 3 for BCS Meridian 1 digital sets.
- NDR4 PBX	0-255	Network Distinctive Ring 4 cadence for analog (500/2500 type) sets.
- NDR4 BCS		Network Distinctive Ring 4 for BCS Meridian 1 digital sets.

Feature operation

There are no operating procedures specified for this feature.

Network Application Protocol Link Enhancement

Contents

The following are the topics in this section:

Feature description 1301
Operating parameters 1302
Feature interactions 1302
Feature packaging 1302
Feature implementation 1302
Feature operation 1302

Feature description

This enhancement of the ISDN Network Application Protocol (ISDN NAP) feature for Meridian Mail services provides improved fault-detection responses. When a NAP link fails, a predefined time period is allowed to pass before the link is declared ‘out of service’. Restoration of the link within this recovery time period will result in uninterrupted service.

The signaling from the caller’s set is ignored during the link failure. However, calls which were already established will remain established during the recovery period. Should the link be declared ‘out of service’, only those established calls which use trunks without disconnect supervision will not be maintained. (Such calls will be requeued to the front of the waiting queue.)

When a link is in the recovery period, calls ringing to an agent are held in the ringing state, until either the recovery period ends or the link is reestablished. Incoming calls requiring Meridian Mail services are placed in the ACD queue, linked to an agent (if possible) and given ringback tone.

When a link is declared ‘out of service’, calls which are ringing at an agent are requeued. Requeued calls and incoming calls on the ‘out of service’ link receive night-service treatment.

Normal operations resume as soon as the link is restored.

Operating parameters

This feature applies only to the ISDN environment.

Feature interactions

There are no feature interactions specified for this feature.

Feature packaging

The following packages are required for Network Application Protocol Enhancement:

- ISDN Application Protocol Link for Third-party Vendors (IAP3P) package 153, which is dependent on
  - — Basic Automatic Call Distribution (BACD) package 40.

Feature implementation

There are no administration requirements specified for this feature.

Feature operation

There are no operating procedures specified for this feature.

Network Attendant Service

Contents

The following are the topics in this section:

Feature description 1303
Network Attendant Service capabilities 1306
Centralized Attendant Service vs. Network Attendant Service 1310
Operating parameters 1311
Unsupported features 1312
Feature interactions 1312
Feature packaging 1314
Example of NAS implementation 1315
Feature implementation 1316
Task summary list 1316
Feature operation 1321

Feature description

Network Attendant Service (NAS) provides stand-alone attendant capabilities throughout a network. Any node in the network may have its attendant services located at any other node in the network, part-time or full-time.

The activation of Network Attendant Service is controlled by the NAS key on the Attendant Console. When a call is presented to an attendant and the NAS key is not activated, the call receives normal attendant service. If the NAS key is activated, the call receives alternate treatment, based on one of the NAS conditions described below.

Network Attendant Service schedule

The NAS schedule allows a prioritized list of attendant alternatives (attendant locations) to be defined for up to 31 half-hour time periods. Each period can have up to four alternate attendants defined against it. During one of these time periods, a request for attendant service will use one of the alternatives, according to the specified order - the first attendant alternate is attempted, and if all attendants are in Position Busy, the following alternate in the sequence is attempted, and so on.

If none of the attendant alternatives are available, an attempt is made to give local attendant service, which may lead to the application of local NIGHT service.

Night Service

Night Service treatment is defined individually for each node.

With the introduction of NAS routing, identifying whether or not a system is in Night Service becomes more complex. Table 87 shows when Night Service treatment is in effect. When all the conditions in a vertical column are met, the system is considered to be in Night Service.

Table 87
Determination of Night Service

Local Attendants exist	No	No	No	Yes	Yes	Yes
Local Night active				Yes	Yes	Yes
NAS key active	No	Yes	Yes	No	Yes	Yes
No alternatives in current NAS schedule		Yes			Yes	
All alternatives in current NAS schedule tried			Yes			Yes

Status of local attendants

When NAS routing is active and there is an available attendant at the local switch, the call terminates at the local attendant, if one is available. If a local attendant is not available, the call may either be placed in the local attendant queue (if the Call Waiting threshold has not been exceeded and the console Call Waiting lamp is not flashing), or may receive local NIGHT service.

Alternate routing to attendant positions

Calls can be routed from one attendant to another attendant location in the network. Each node can be programmed with the attendant DNs for up to seven other switches. Up to four of these seven attendant DNs can be used as alternatives for any one time period. Each of the four attendant alternatives for each time period can have Drop Back Busy and/or Off-hook Queuing options configured.

If a call is to be routed to an alternate attendant at another node and all trunks to the other node are busy, the call is queued for an available route to the alternate (if the alternate has the Off-hook Queuing feature). The call remains queued for a specified time, which, upon expiring, causes the call to be directed to the next alternate attendant.

The operation of NAS routing, as controlled by the activation of the NAS key, is summarized in Table 88.

Table 88
NAS Routing Possibilities

	NAS Key	Home Attendant	Night Key	CW Lamp	Trunks to Remote	Action
1	Dark	All Busy	Dark	X	X	Queue to Home Attendant
2	Dark	Not Busy	Dark	Dark	X	Select Home Attendant
3	Dark	X	Lit	X	X	Route to Home Night
4	Lit	Not Busy	Dark	Dark	X	Select Home Attendant
5	Lit	All Busy	Dark	No Flash	X	Queue to Home Attendant
6	Lit	All Busy	Dark	Flash	Not Busy	Route to Remote Attendant
7	Lit	All Busy	Dark	Flash	All Busy	Queue to Home Attendant
8	Lit	X	Lit	X	Not Busy	Route to Remote Attendant
9	Lit	X	Lit	X	All Busy	Queue to route

Drop Back Busy

When a call reaches a Remote node, no attendant is available, and NAS routing or Night Service at that switch is about to be performed (if the Drop-back busy option was set at the originating switch and sent with the call), the call is treated by the originating switch as though no attendant is available at the Remote switch. Another alternative is selected from the originating switch.

> ***Note:*** Drop Back Busy (DBB) and Remote Virtual Queuing (RVQ) are both packaged under the Originating Routing Control/Remote Virtual Queuing (ORC-RVQ) package 192. If RVQ and DBB are both configured, DBB will take precedence over RVQ. If the user wishes to activate RVQ, DBB must be disabled for a route entry in response to the IDBB prompt. If the user wishes to activate DBB, it must be enabled by entering DBI or DBA.

Attendant Off-hook Queuing

During peak periods, a call may be prevented from reaching a remote attendant if all possible routes to that attendant are busy. If these routes have off-hook queuing, the call will queue on these routes. If activated in the NAS programming and on the route list for the call, queuing occurs before the system attempts other alternatives. The alternatives are tried after the Off-hook Queuing (OHQ) timer expires.

Network Attendant Service capabilities

The following sections describe the network capabilities that are offered as part of NAS.

Break-in

The Break-in feature allows an attendant to enter an established call anywhere in the network and to offer another call or important message to one of the parties involved in the call. Break-in is provided as a key (BKI) function. The BKI key can be pressed before dialing the DN of the required station (pre-dial) or after (post-dial).

When the BKI key is pressed, the following situations may exist:

- **Break-in request recognized** — this is a temporary processing state, that occurs when an attendant tries to break-in to a party at another node, and lasts until the signaling protocol for the break-in attempt is completed.
- **Break-in ignored** — this state occurs if the required party has disconnected at the point of break-in, is idle without the Make Set Busy or Do Not Disturb features active, or is idle with the Call Forward feature active. In all cases, the party is rung, and the attendant can extend the call.
- **Break-in allowed** — the attendant can break into the required party, consult with the required party, and extend another call to the party if (a) the source is an external call, (b) Camp-on is available on the required party, and (c) the established call is a basic call.
- **Break-in denied** — break-in is not allowed if any of the above conditions are not met.
- **Break-in temporarily denied** — the attendant temporarily cannot break-in to the required party, but can try again later. This situation occurs if:
  - — the required party is dialing, involved in a consultation call, or is on hold
  - — the required party's set is ringing or receiving an indication tone
  - — the required party's set is connected to a paging, dictation, recorded announcement, or integrated voice messaging trunk
  - — the party to be extended is a local party or trunk with warning tone denied Class of Service
  - — network blocking to a remote node has been encountered
- **Break-in consult only** — the attendant can break into the required party, and can consult with the party but cannot extend another call. This situation occurs if:
  - — the attendant originates the call
  - — the source is an internal call
  - — the source is an external call and neither Camp-on nor Call Waiting is possible on the required party

— the attendant attempts a pre-dial break-in and the required party is busy with Call Forward active.

Call extension

Restrictions that apply to attendants at local nodes also apply to calls extended across the network to remote node attendants.

Attendant control prevents the calling set from disconnecting until the attendant releases. Once the attendant releases or extends and releases the call, attendant control is relinquished.

Timed reminder recalls

Timed reminder recalls are attendant-extended calls that return to the attendant when their timers expire. The timers apply to slow answer calls, camped on calls, and call waiting calls.

When the attendant extends the call to a party at another node, the trunks between the attendant and the source and the attendant and the destination are not taken down after the Release key is pressed. This is true even if tromboning has occurred. This allows the attendant node to monitor the outgoing trunk for an answer signal. If no answer signal occurs within the specified time, the call is presented again to an attendant (or to the original attendant, if Recall to Same Attendant is active on the attendant node).

Anti-tromboning is only invoked after the destination has answered and the attendant has released from the call.

Incoming Call Indication

The Incoming Call Indicators (ICI) will operate in the same manner as a stand-alone Meridian 1 for incoming calls from stations or trunks.

New ICI types are introduced for NAS routed calls for each trunk type. The indicators can be the following:

- a dial 0 call (ordinary or fully restricted)
- a recall request
- a line lockout intercept
- Call Redirection (Call Forward No Answer, Call Forward Busy)
- an interpositional call

- a Listed Directory Number (LDN)
- a Message Center call
- NAS trunk types (type of trunk on which the call came into the originating switch. The choices are: NDID, NCO, NTIE, NFEX, and NWAT)

Attendant Display

Three features which pass information useful for attendant display are:

- Calling Line Identification (CLID)
- Network Call Party Name Display
- Network Call Redirection

For incoming calls, the CLID received (if available), is displayed instead of the Trunk Route Access Code and Trunk Member Number. If the call comes from the private ISDN network and there is a name associated with the calling telephone, the name is displayed on consoles with alphanumeric displays.

Reason for redirection codes are displayed if the call has been redirected by a feature such as Call Forward All Calls.

Camp-on and Call Waiting

Both Camp-on and Call Waiting allow calls extended to a busy set a further opportunity to reach that set. If the call is extended across the network to a busy set, Camp-on or Call Waiting may be attempted in the same manner as in the stand-alone case.

Tenant Service

If Multi-Tenant (TENS) software package 86 is equipped, the table number in the NAS overlay programming can be referenced to an individual Console Presentation Group. Each tenant can have its own individual NAS routing programmed.

Centralized Attendant Service vs. Network Attendant Service

NAS has some similarities to a previous non-ISDN application called Centralized Attendant Service (CAS). There are significant differences as well.

Note: NAS and CAS cannot be configured on the same Meridian 1.

Centralized Attendant Service

- Allows attendants to be centralized at one Main switch connected to Remote switches with Release Link Trunks (RLTs).
- When a remote switch has the CAS feature key activated, incoming calls to the Remote switch are redirected to the Main switch where an attendant answers the call.
- The call comes into the Main switch on an RLT. The attendant can extend the call back to a telephone at the Remote switch. The call is routed on the same RLT trunk which was used when the call came into the Main switch.
- Once the call is ringing at the telephone, the RLT trunk is released.
- If the telephone goes unanswered, the call recalls to the attendant at the Main switch. A Release Link Trunk is used for the recall.
- The CAS feature is activated using a key on a proprietary telephone or console at the Remote switch.
- When users at different switches call each other or the attendant places a call to another switch, normal TIE trunks are used.

Network Attendant Service

- NAS allows several switches to have attendants who answer calls which have been redirected by the NAS feature. The switches are connected with Primary Rate Interface (PRI) or ISDN Signaling Link (ISL) connections.
- NAS routing allows a call destined for the local attendant to be diverted to a Remote attendant. This routing is governed by a NAS schedule, a NAS key, or a permanent NAS Active setting which can be programmed.

- NAS calls can result in tromboned trunk connections between the Remote switch and the Attendant switch. These connections remain until the ringing telephone answers the call. This can result in two tromboned TIE trunks or channels being held up while a telephone is ringing.
- If anti-tromboning has been programmed, the tromboning is corrected after the telephone is answered.
- If the telephone goes unanswered, the call recalls to the attendant at the Main switch. A PRI channel or ISL trunk is used for the recall.
- A NAS key may be optionally programmed on an Attendant Console.
- NAS calls and normal user calls all use the same PRI/ISL trunks.

There are three additional differences between NAS and CAS:

- NAS routing is used when calls waiting in the local attendant queue exceed one of two thresholds. CAS routes all calls to the Main CAS switch.
- NAS chooses an attendant from up to four alternatives per time period. With CAS, each Remote site has only one Main switch to which to route calls.
- NAS routing can also be based on the status of trunks to other nodes and Night Service indicator status. These factors do not affect call routing with CAS.

Operating parameters

NAS and the Centralized Answering Position (CAP) capability are mutually exclusive. A Meridian 1 system may not have an actual attendant console. Instead, the system may be configured to use a Centralized Answering Position (using a Meridian 2616 digital set.) The CAP Directory Number (DN) is the customer Night DN. Since no attendant is configured, the customer is viewed to be in Night Service and any calls for the attendant are directed to the CAP.

Note: An attendant answering position must be an attendant console, and not a Meridian digital set.

NAS and Centralized Attendant Service packages are mutually exclusive and may not be packaged together.

NAS and Attendant Overflow Position packages are mutually exclusive and may not be packaged together.

Trunk Group Busy applies only to trunk groups on the node where the attendant resides.

The Uninterrupted Line Connection feature continues to work on a stand-alone switch basis; however, Network-wide Break-in, based on warning tone Class of Service, cannot be guaranteed. Only one Attendant at a time is allowed to break into a connection. Break-in is allowed for telephones only, not trunks or other attendants. Attendant Control is not provided if the connection is a result of a Network Break-in.

Unsupported features

NAS does not support:

- Supervisory Console
- Call Park
- Charge Account
- Do-Not-Disturb and Group Do-Not-Disturb.

The following functions and features are not supported across the network:

- Barge-in
- Busy Verify
- Emergency transfer.

Feature interactions

Attendant Interposition Call

An attendant is not able to call a specific attendant on another node by dialing the attendant DN followed by the attendant number. The attendant dials the Network Alternate Route Selection (NARS), Coordinated Dialing Plan (CDP), or Listed Directory Number (LDN) the same way a telephone dials to reach the attendants at another node.

Busy Verify

Pre-dial Break-in provides equivalent functionality but has several advantages over Busy Verify. Busy Verify does not operate on a network-wide basis.

Call Forward, Break-In and Hunt Internal or External Network Wide

When a call is transferred, a new facility message is sent to the transferred party's node to transport the terminal indicator parameter or the access trunk information parameter.

DPNSS1 Route Optimisation/MCDN Trunk Anti-Tromboning Interworking

If tromboning trunks are removed on the MCDN side of a RO/TAT Interworking gateway scenario by the Network Attendant Service feature (since NAS has presence over TAT), the RO/TAT Interworking functionality is not invoked. The result is that, if NAS is equipped, attendant-extended calls that are in a tromboning state are optimised on the MCDN side, but DPNSS1 trunks are not optimised on the DPNSS1 side of the RO/TAT Interworking gateway scenario.

EuroISDN Trunk - Network Side

NAS signaling is not supported on a EuroISDN Trunk - Network Side connectivity. However, NAS will interwork with an incoming call from the EuroISDN Trunk - Network Side (routing and call handling).

INIT ACD Queue Call Restore

Call information associated with Network Attendant Service is lost after system initialization and call restoration.

ISDN QSIG Basic Call

ISDN QSIG Basic Call interacts with Network Attendant Services (NAS) as if the call is going to a route without NAS being equipped.

Listed Directory Numbers, Network-wide

This feature enables LDNs to be recognized network- wide when NAS is used. Up to six LDNs can be defined per Meridian 1. The same LDNs must be configured in multiple nodes. The LDN which users dial can be programmed as a CDP number, for example, and input in the NAS overlay as the ID of remote attendants.

Recall to Same Attendant

This feature operates on a network-wide basis for the following call types:

- Slow Answer Recall
- Camp-on Recall, and
- Call Waiting Recall.

The operation of this feature is affected by the programming for the option in the Customer Data Block of the system where the attendant answering the call resides.

Virtual Network Services

As stated earlier, NAS and CAS cannot be configured together on the same Meridian 1. Since VNS requires NAS, this means that VNS and CAS cannot be configured together on the same Meridian 1, either.

Feature packaging

The following packages are required for NAS:

- Basic Routing (BRTE) package 14;
- Basic Queuing (BQUE) package 28;
- Network Class of Service (NCOS) package 32;
- Network Automatic Routing System (NARS) package 58; or
- Coordinated Dialing Plan (CDP) package 59;
- Flexible Call Back Queuing (FCBQ) package 61;
- Attendant Break-In/Trunk Offer (BKI) package 127;
- Integrated Services Digital Network (ISDN) package 145;
- Advanced ISDN Network Services (NTWK) package 148;
- International Primary Access (PRA) package 146; or
- 2.0 Mb Primary Rate Interface (PRI2) package 154; or
- ISDN Signaling Link (ISL) package 147;
- Network Attendant Services (NAS) package 159;
- ISDN Supplementary Features (ISDNS) package 161;

- Originating Routing Control/Remote Virtual Queuing (ORC-RVQ) package 192 for Drop Back Busy (please see note under “Drop Back Busy” description.);

Example of NAS implementation

Figure 108 illustrates a simple application of the NAS functionality in a private ISDN PRI network connecting three Meridian 1 systems. Although this example uses NARS, the same functionality can be accomplished using CDP.

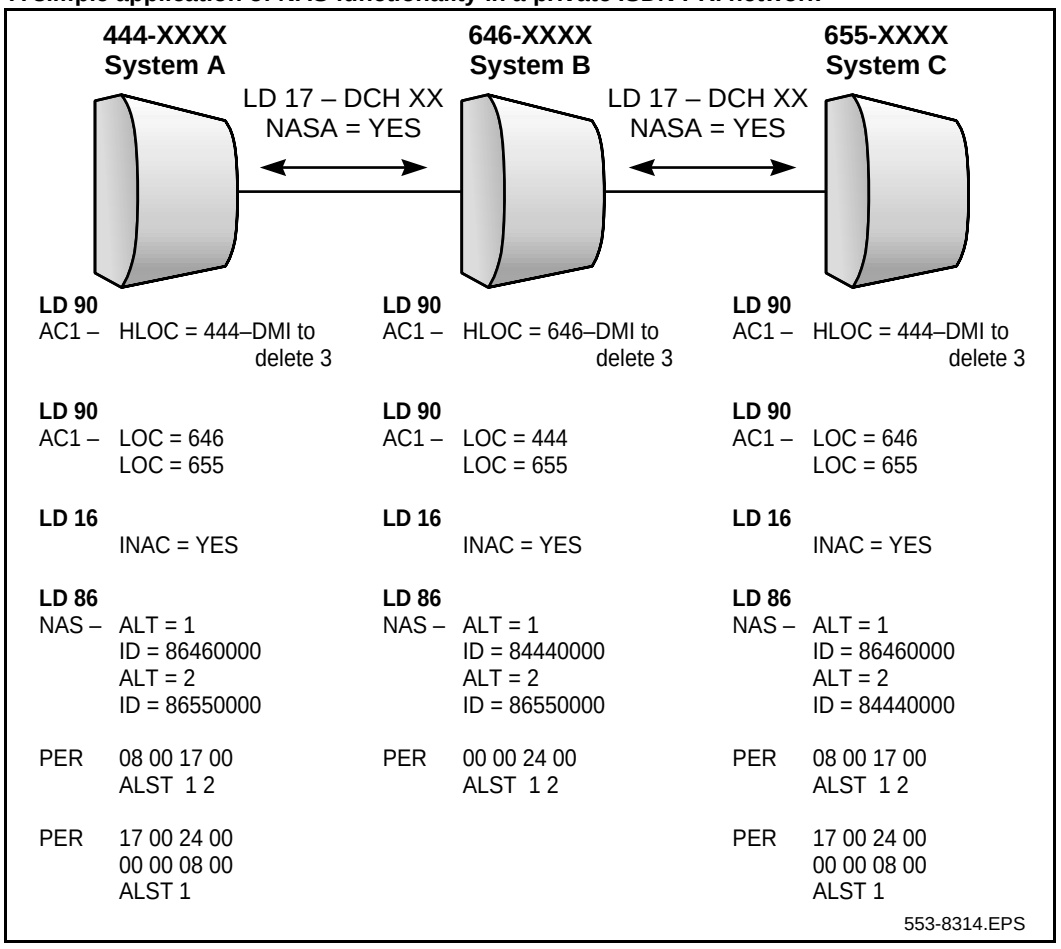
Each system has the translations in place for a HLOC and the two LOC codes for the other two Meridian 1 locations. This programming was done in the NARS database. The route lists required in order to process these types of calls have been programmed also.

The INAC implementation was part of the basic ISDN/Networking programming.

The NAS programming involves the configuration of the D-channel for NAS functionality, the ID of the other attendants to be used, a list of the sequence in which these attendants are to be scanned for availability and the time periods for each list.

System B, in this example, is the location where attendants should be available 24 hours a day. During the day, the other two locations are programmed to use System B as their first choice backup and then as a second choice System A uses System C and System C uses System A. At night, Systems A and C use System B as the only backup. If it is unavailable, calls will be given Night Service.

Figure 108
A simple application of NAS functionality in a private ISDN PRI network



Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 12 – Configure Attendant Consoles with NAS keys.

2 LD 15 – Enable or disable network attendant control, Recall to Same Attendant, NAS routing, and define a TRK ICI key.

3 LD 17 – Configure the D-channel interface (DCHI) for NAS.

4 LD 86 – Configure NAS routing.

5 LD 93 – Assign a NAS routing table to Console Presentation Groups.

6 LD 16 – Allow or deny pre-answer tromboning (allow or deny an incoming call to be directly routed back on the same route).

LD 12 – Configure Attendant Consoles with NAS keys**.**

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	ATT 1250 2250	Type of console
TN	l s c u	Terminal Number.
	c u	For Option 11.
KEY	xx NAS	xx is the key number assigned the NAS function. Each Attendant Console can have only one NAS key defined. This key is optional.

LD 15 – Enable or disable network attendant control, Recall to Same Attendant, NAS routing, and define a TRK ICI key.

Prompt	Response	Description
REQ:	CHG	Change existing data block.
TYPE:	NET	Networking Data.
CUST	xx	Customer number.
- OPT	aaa	Options.
- AC2	aaa	Access Code 2 as defined in LD 86.
- ISDN	YES	Integrated Services Digital Network

...		
- NAS	(YES) NO	Specifies whether to (allow) or deny attendant control for call extension.
...		
- ICI	xx	Respond with the key number, from 0 to 19, followed by a space, followed by the trunk type.
	NCO	Network CO trunk
	NDID	Network DID trunk
	NTIE	Network TIE trunk
	NFEX	Network FEX trunk
	NWAT	Network WAT trunk
- RTSA	(RSAD)	Recall to Same Attendant Denied
	RSAA	Recall to Same Attendant Allowed
	RSAX	Recall to Same Attendant allowed, with queuing on busy attendant.

LD 17 – Configure the D-channel interface (DCHI) for NAS.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	ADAN	Action Device and Number.
DCHI	xxx	Respond with DCHI number for which NAS signaling is to be allowed or restricted.
NASA	(NO) YES	Specifies whether DCHI is to be allowed or (denied) NAS signaling.

LD 86 – Configure NAS routing.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.

CUST	xx	Customer number.
...		
FEAT	NAS	Specifies type of data to be changed.
TBL	0–63	Routing table number, from 0 to 63. Without Multi-Tenant Service, 0 is the customer routing table. With Multi-Tenant Service enabled, NAS tables 1-63 may be associated with CPGs 1-63.
ALT	1–7	An alternative attendant or routing table, from 1 to 7. (To clear an old number, type an X before typing the new number. The old number cannot be cleared if it is associated with a schedule period. Reach TODS by pressing the return key.)
ID	xxxxxxxxxxxxxxxx	The dialed digits (including the network access code) needed to reach an attendant associated with the alternative number. Respond with a string of up to 16 digits to change the attendant ID; press the return key to leave the ID unchanged, exit the prompt, and return to ALT.
TODS	0–31	Specifies a schedule period, from 0 to 31, where 0 is the default to handle all time periods not defined in 1 through 31. Type an X before a period number to remove the schedule period. (Typing an X before a 0 clears all associated alternatives, leaving the default treatment as local attendant treatment.) Press the return key to continue the NAS feature setup process.
- PER	HR MIN HR MIN	Specifies the start and stop times for the period using 24-hour format. Start time must be before the stop time, and minutes can be only 00 or 30. Press the return key to leave times unchanged and move to the DAYS prompt.
- DAYS	D D.… D	Specifies applicable days of the week for the time period. Respond by inputting a number representing each day for which the schedule is active (where 1=Monday, 2=Tuesday,...7=Sunday). Type an X before the day number to deactivate the schedule period for that day. No more than seven entries are permitted on an input line. Press the return key to leave this schedule unchanged and move to the next prompt. (If not otherwise specified, a schedule period is assumed valid for all days.)

ALST	xxxx	Alternative list to be used for the schedule period. Respond with up to four alternative numbers in the order in which they are to be attempted. (These numbers are defined using ALT.)
DBK	Z Z Z Z	Alternatives for which “drop back busy” is to be active during this period. Respond with four entries of Y (allow) or N (deny) for the alternative evoked by the previous prompt. Responses are applied in sequence.
QUE	Z Z Z Z	Specifies alternatives for which queuing to a route is to be allowed during this period. Respond with four entries of Y (allow) or N (deny) for the alternatives evoked by ALST. Responses are applied in sequence. If the response is Y, off-hook queuing must already be configured for calls to be queued on this route.

LD 93 – Assign a NAS routing table to Console Presentation Groups.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	CPG	Console Presentation Group.
CUST	xx	Customer number.
CPG	1-63	Console Presentation Group number.
CPGS	(NO) YES	Customer Presentation Group Services.
ROUT	0-511	Route number.
TEN	1-511	Tenant number.
NTBL	(0) - 63	NAS routing table to be used for calls directed to this Attendant Console Group(ACG)/ Console Presentation Group (CPG).

LD 16 – Allow or deny pre-answer tromboning (allow or deny an incoming call to be directly routed back on the same route).

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	RDB	Route Data Block.
CUST	xx	Customer number.
ROUT	0-511	Route Number.
TKTP	aaa	Trunk Type requires response when REQ=NEW.
TRMB	(YES) NO	Tromboning. NO = Tromboning denied. Incoming trunk call on route may not be routed back on same route. YES = Tromboning allowed. Incoming trunk call on route may be routed back on the same route. Only applies to calls routed using NARS/BARS or CDP. Does not apply to calls redirected by Hunt, Forward All Calls, or Forward No Answer.

Note: The anti-tromboning capabilities programmed in LD 16 only apply to attendant extended calls.

NAS performs tromboning when required regardless of the LD 16 programming. However, if redundant (or tromboned) trunk connections are to drop after the telephone is answered, this prompt must be set to NO across the network where this might occur.

Feature operation

There are no operating procedures specified for this feature.

Network Call Party Name Display/ Network Name Delivery

Contents

The following are the topics in this section:

Feature description 1324
Network Call Party Name Display 1324
Network Name Delivery 1326
Operating parameters 1326
Feature interactions 1326
Feature packaging 1326
Feature implementation 1327
Task summary list 1327
Feature operation 1328

Reference list

The following are the references in this section:

- *Features and Services* (553-3001-306)

Feature description

Network Call Party Name Display

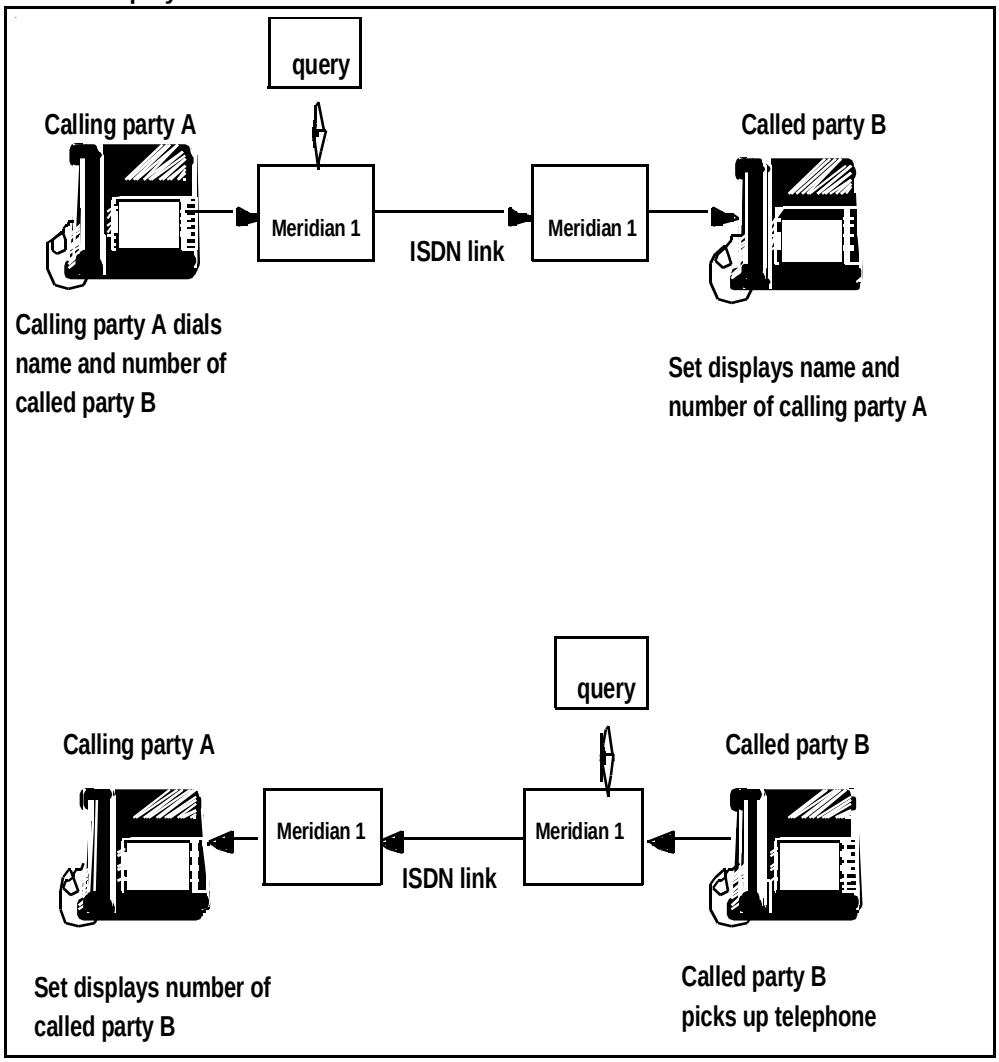
Network Call Party Name Display (NCPND) provides a network-wide visual display of names and telephone numbers to both parties of a call. For telephones equipped with an alphanumeric display, NCPND provides the display of the calling party's name on the terminating telephone and the called party's name on the calling telephone. The name and number display lasts for the duration of the call.

The sending of the names over the private network is an option set up on a per route basis. The name is provided by Call Party Name Display (CPND) configured in each switch. For call redirections, a set option provides a display of the redirecting name instead of the calling name.

The following telephones and Attendant Consoles are supported:

- M2317 digital telephones
- M3000 Touchphone
- all Meridian Modular Telephones with digit display
- M1250 and M2250 Attendant Consoles

Figure 109
NCPND displays



Network Name Delivery

Network Name Delivery (NND) is the method used to send the names and numbers across the network. Network Name Delivery provides network-wide name display in compliance with the Meridian Customer Defined Networking (MCDN) protocol. It allows interworking among Meridian 1s and a DMS-100/250 Central Office.

Operating parameters

The following list describes the Network Name Delivery operating parameters.

- For Meridian 1 to Meridian 1, the maximum number of characters in a displayed name is 24. When connecting to a Central Office, 15 characters only are supported. Names exceeding this length are truncated.
- Name Delivery is supported for Call Pickup, Call Transfer, Hunt, and Call Forward All Calls/No Answer/Busy.
- A CPND enhancement allows the display of the redirecting name on the terminating telephone instead of the calling name by a service change option only if the first redirecting party is on the terminating switch.
- In all cases, when the name is available, the called party name is displayed on the caller's display during the ringing phase. This is an enhancement over ND1 which displays names on connect.

Feature interactions

The same feature interactions apply as those for Call Party Name Display; refer to the Call Party Name Display description in *Features and Services* (553-3001-306)

Feature packaging

The following packages are required for Network Call Party Name Display/Network Name Delivery:

- Calling Party Name Display (CPND) package 95;
- Integrated Services Digital Network (ISDN) package 145;
- ISDN Primary Rate Interface (PRI) package 146; or
- 2.0 Mb Primary Rate Access (PRI2).

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 95 – Configure the Calling Party Name Display.

2 LD 16 – Enable NCPND for each required trunk route.

3 LD 17 – Indicate the remote capability (which Network Name Delivery protocol is supported by the remote node/switch on this DCH interface).

LD 95 – Configure the Calling Party Name Display.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	CPND	Calling Party Name Display.
CUST	xx	Customer number.
...		
- NITC	aaaa (NI)	Non-Hot Line call. Indicates that the Hot Line call terminated as a normal call.

LD 16 – Enable NCPND for each required trunk route.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	RDB	Route Data Block.
CUST	xx	Customer number.
ROUT	xx	Route Number.
...		
- ISDN	YES	ISDN option.

...		
- - NCNA	(YES) NO	Allow Network Call Name Display.

LD 17 – Indicate the remote capability (which Network Name Delivery protocol is supported by the remote node/switch on this DCH interface).

Prompt	Response	Description
REQ	CHG	Change.
TYPE	ADAN	Type of data block.
ADAN	CHG DCH x	Change D-channel. x = 0-63.
...		
- RCAP	ND1 ND2	Network Name Delivery method 1 (ND1). Network Name Delivery method 2 (ND2).

Feature operation

There are no operating procedures specified for this feature.

Network Call Redirection

Contents

The following are the topics in this section:

Feature description 1329
Operating parameters 1342
Feature interactions 1343
Feature packaging 1344
Feature implementation 1344
Task summary list 1344
Feature operation 1347

Feature description

The Network Call Redirection feature provides Network Call Forward No Answer (NCFNA) and Network Call Forward All Calls (NCFAC) over an ISDN PRA or ISL network. Calls can also be transferred over the network, but the CLID display will not reflect the transfer.

The Network Call Redirection (NCRD) feature is based on the stand-alone Call Redirection feature. Stand-alone Call Redirection permits redirection within a single Meridian 1 system. Using Network Call Redirection, calls are redirected over more than one Meridian 1 system. The user cannot tell the difference between a call-redirected and a network call-redirected call. The CLID digit and the name displays are the same for both call scenarios.

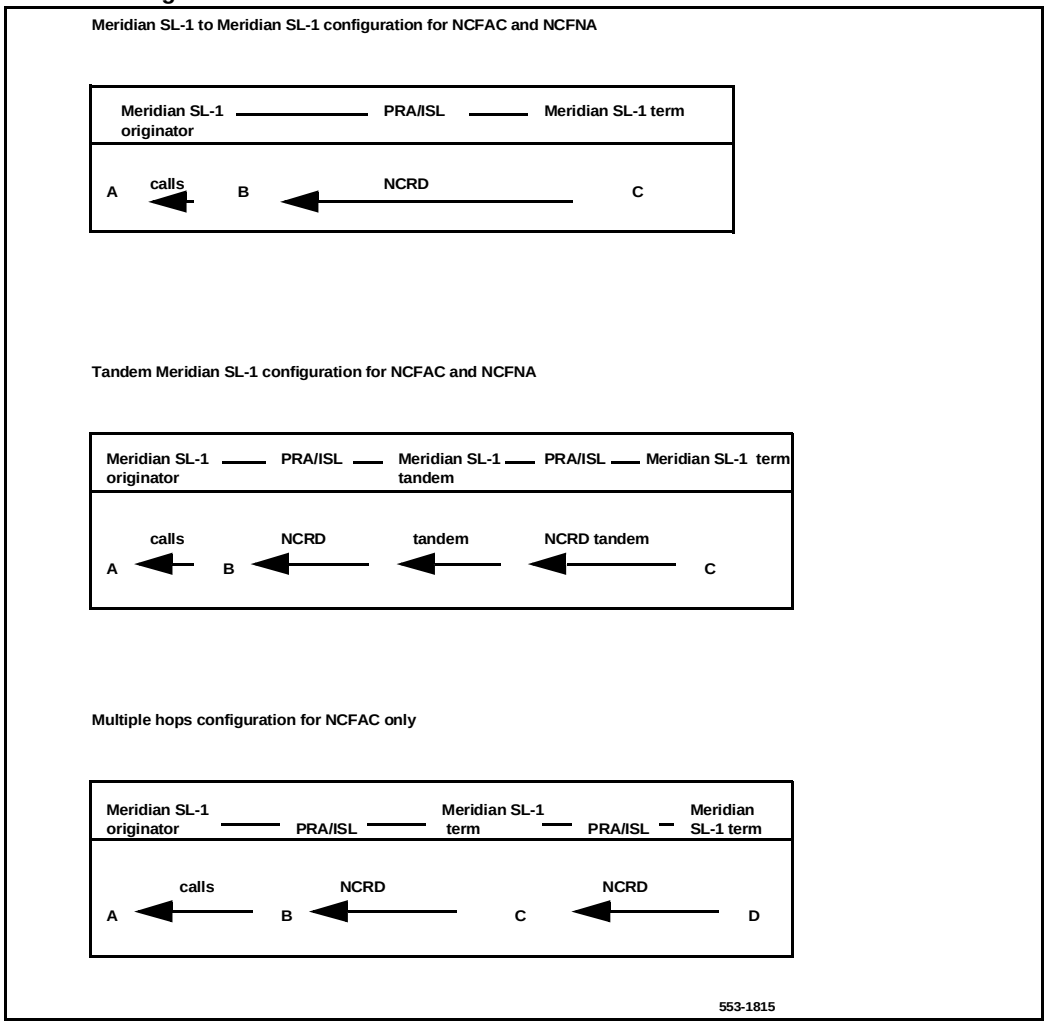
NCRD supports Meridian 1 to Meridian 1 connections. The private numbering plans, the Uniform Dialing Plan (UDP), and the Coordinated Dialing Plan (CDP) are supported by both network configurations.

For NCFNA, the call can pass through (hop) only one switch. However, as shown in Figure 110, a multiple-hop configuration is permitted for NCFAC.

The number of times a call is redirected depends on the Class of Service (CLS) of the redirecting set. If the redirecting set has a CLS with second-level NCFNA denied, only one NCFNA is allowed. If a second NCFNA attempt is made, it is rejected and the call continues to ring at the first redirected station. If the redirecting set has a CLS with second-level NCFNA allowed, the call can have an additional CFNA redirection.

Note: A redirected call over PRA that terminates on a busy set cannot activate the Network Ring Again (NRAG) feature. Also, CLID name display is not supported in call transfer, call forward busy, hunt, or call pickup.

Figure 110
Network configurations for NCFAC and NCFNA



Call redirection terminology

There are four parties involved in a call redirection: the originating party, the originally called party, the redirecting party, and the terminating party.

If A calls B and B redirects the call to C, then:

A is the originating party
B is the originally called party and the redirecting party
C is the terminating party

With additional redirections, the terminology changes. For example, if A calls B and B redirects the call to C and C redirects the call to D and D redirects the call to E, then:

A is the originating party
B is the originally called party
C is the no name party
D is the redirecting party
E is the terminating or redirection party

Figure 111
Simple redirection

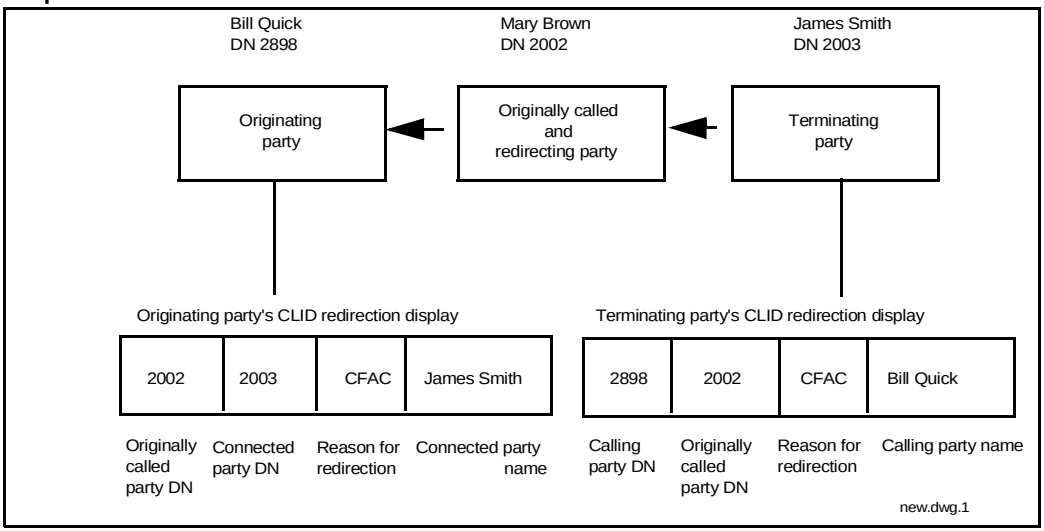
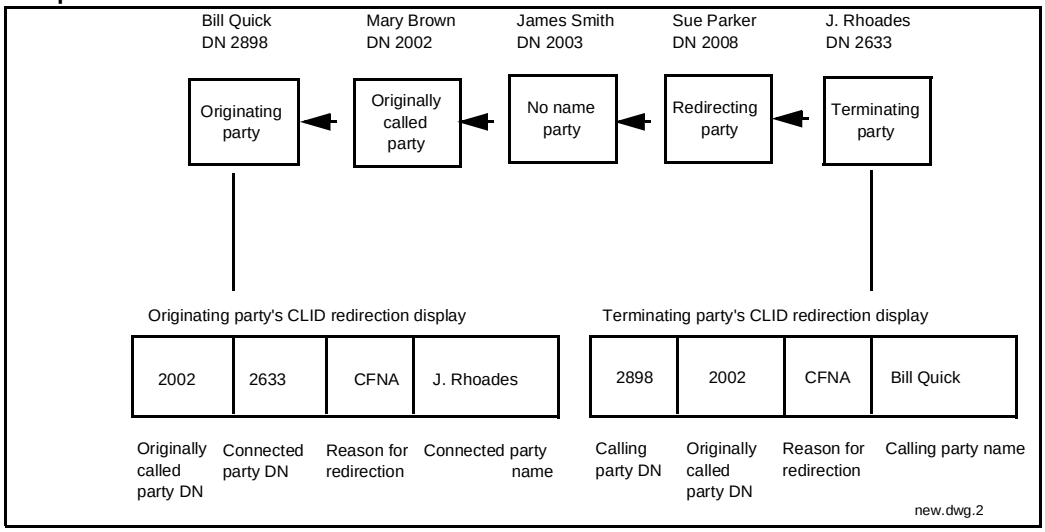


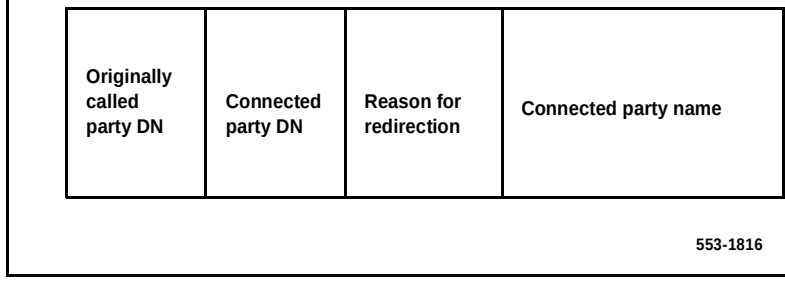
Figure 112
Multiple redirections



Notifying originating party of redirection

As shown in Figure 113, if the originating party is a subscriber to the Calling Line Identification (CLID) service, their set displays a Call Redirection reason. This format is like that of internal call redirection CLID.

Figure 113
Originating party CLID redirection display



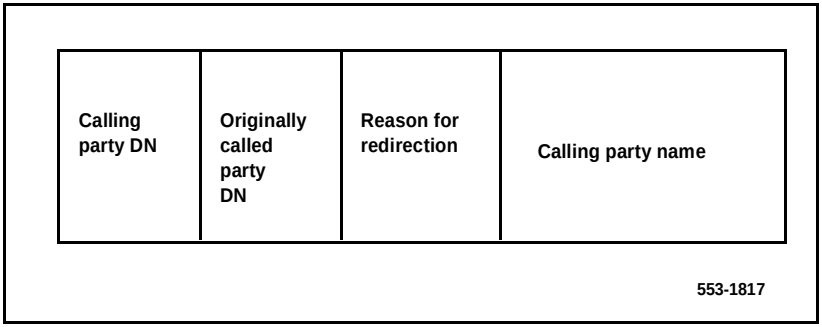
The reason field of the CLID display indicates why the call is redirected out of the original called party, that is either NCFAC or NCFNA. The reason mnemonic displayed is assigned by the customer in Overlay 95. See the PRA Administration document for a procedure about how to program the Network Call Redirection (NCRD) feature.

If the originally called party information is not available, the redirecting party DN is displayed in place of the originally called DN. For single call redirection, the originally called party is also the redirecting party.

Notifying terminating party of redirection

As shown in Figure 114, if the terminating party is a subscriber to the CLID service, their set displays a call redirection reason. The display format for the terminating party is the same as that for an internal Call Redirection.

Figure 114
Terminating party CLID redirection display



If the originating party information is not available, the redirecting party DN is displayed instead.

Redirection tones

The tone the originating party receives is determined by the cause of the redirection. When a call cannot terminate because the forward-to DN is busy and none of the redirections are due to Network Call Forward No Answer (NCFNA), the originator receives a busy tone. However, if one redirection is due to NCFNA, an attempt is made to re-ring the set that initiated the NCFNA.

When the call cannot terminate for any reason other than the forward-to DN is busy and no redirections are due to NCFNA, the originator receives an overflow tone. Again, if one redirection is due to NCFNA, an attempt is made to re-ring the set that initiated the NCFNA.

A redirection counter value is passed with the call-forwarding information. When the redirection counter maximum is exceeded, there are two scenarios. If all call redirections are due to Network Call Forward All Calls (NCFAC), the calling party receives an overflow tone. If one of the redirections is due to NCFNA, an attempt is made to re-ring the set that initiated the NCFNA.

Network Call Redirection configurations

The following figures are examples of typical Call Redirection configurations. The text associated with each figure explains the scenarios. These scenarios are shown:

- Intranode NCFAC
- Internode Tandem NCFAC
- Tandem NCFAC and Intranode redirection
- Tandem NCFAC
- NCFNA
- Tandem NCFNA

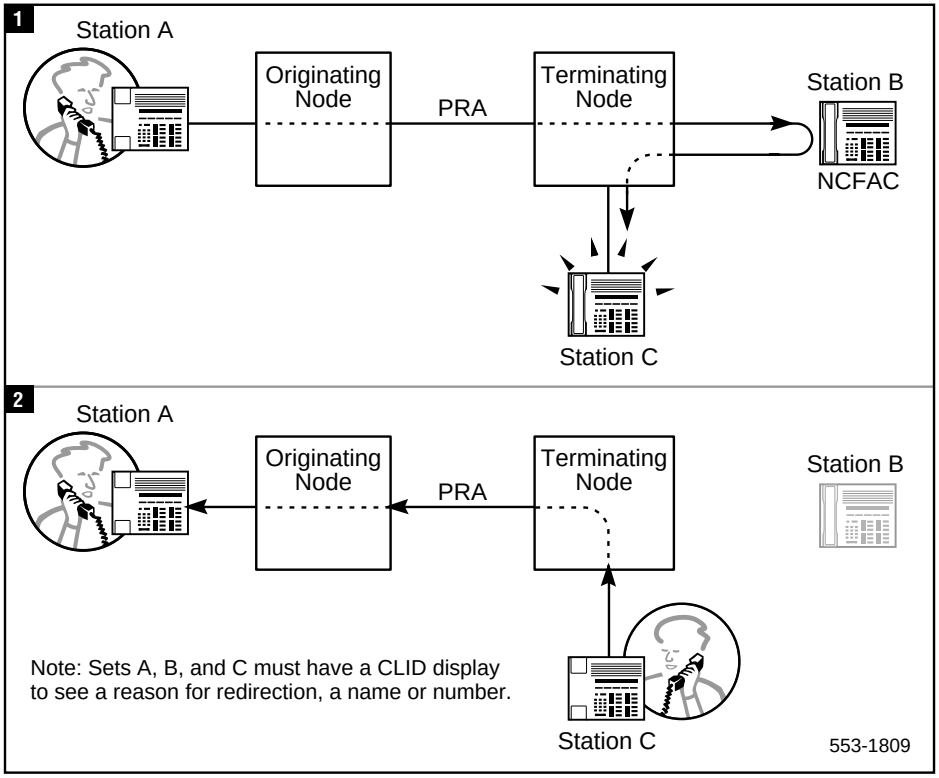
Note: Call Redirection is supported only in Meridian 1 to Meridian 1 call connections.

Intranode NCFAC redirection

As shown in Figure 115, the following occurs in a NCFAC scenario:

- Station A calls Station B on another node. Station B has the Call Forwarding All Calls feature and forwards to Station C.
- The call is then forwarded to Station C. Station C resides in the same terminating node as Station B.
- The terminating node, Station C, sends the CLID display information to Station A. When Station C answers the call, a message is sent to the originating node, Station A.

Figure 115
NCFAC intranode redirection

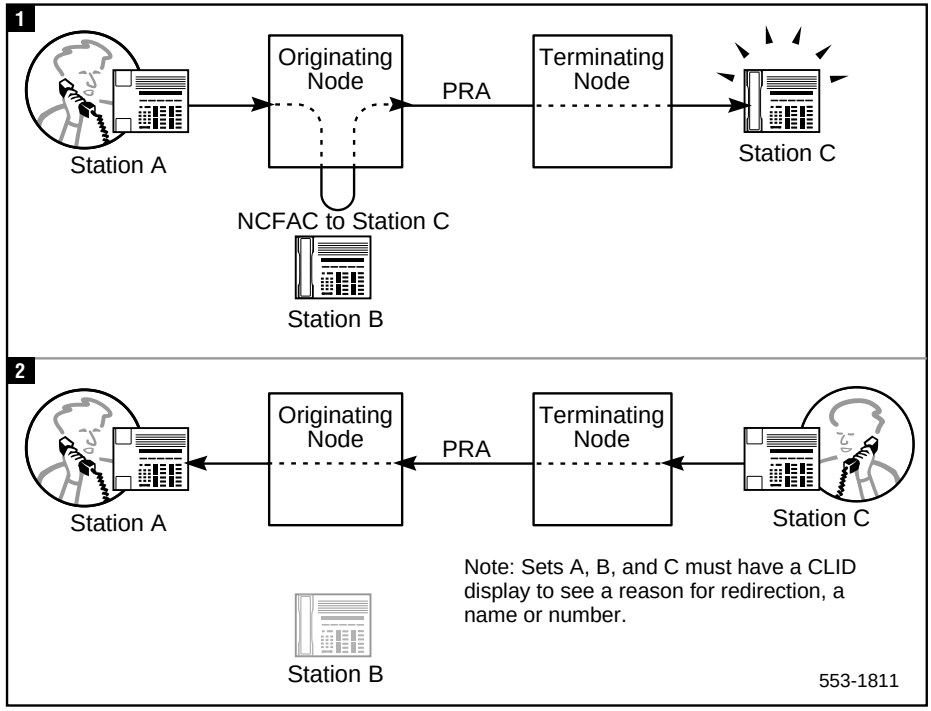


Internode NCFAC redirection

As shown in Figure 116, the following occurs in an internode NCFAC redirection scenario:

- Station A generates a call to Station B. Station B has the Call Forwarding All Calls feature and forwards to Station C. Station C is located on another switch, making this an internode call.
- A message that contains the called number, calling number, original called number, original redirection reason, and the redirection counter is sent with the call.
- When Station C answers the call, a message is sent to the originating node indicating this response.

Figure 116
Internode NCFAC



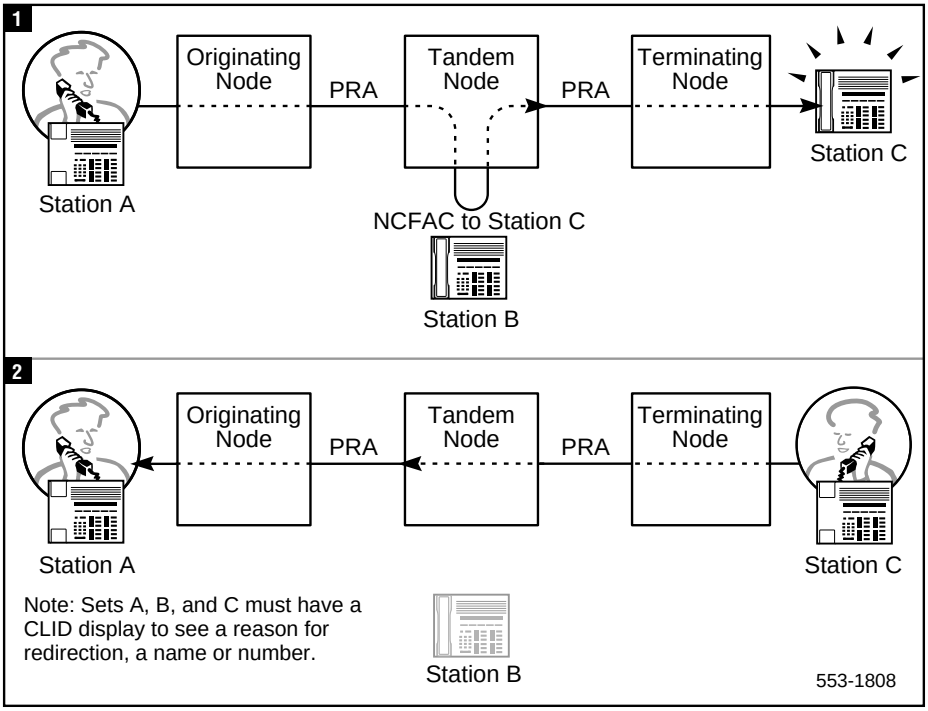
Tandem NCFAC redirection

As shown in Figure 117, the following scenario occurs in tandem NCFAC redirection.

- Station A generates an internode call to Station B. Station B has the Call Forwarding All Calls feature and forwards to Station C on another switch.
- The call is translated at the tandem node and then forwarded to Station C at the terminating node.

- The message that accompanies the call from the tandem to the terminating node contains the called number (Station C), the calling number (Station A), original called number (Station B), the original reason for redirection (NCFAC), and the redirection counter that has a value of 1.
- The terminating node sends a message to the originating node that contains the call forwarding information along with an indication of ringing Station C.
- When Station C answers the call, a message indicating this response is sent first to the tandem node and then relayed to the originating node.

Figure 117
Tandem NCFAC

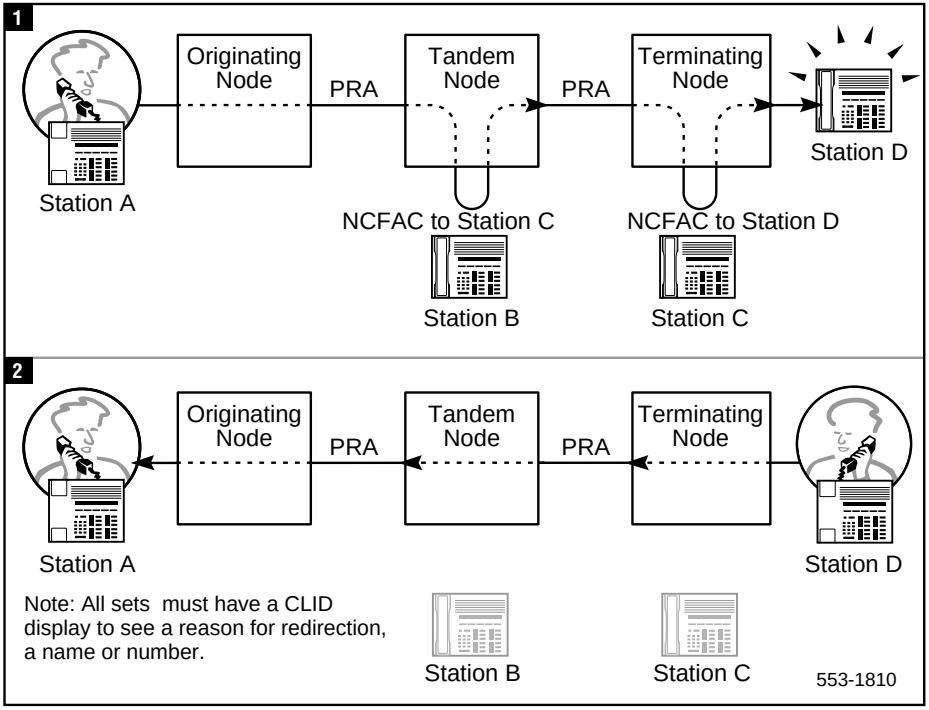


Tandem NCFAC and intranode redirection

The following occurs in a tandem NCFAC. This is followed by an intranode redirection scenario, as shown in Figure 118.

- Station A generates an internode call to Station B. This Station B has the Call Forwarding All Calls feature and forwards to Station C on another node. In this scenario, Station C has the Call Forwarding All Calls feature and forwards the call to station D on the same node.
- The call is forwarded from the tandem node to the terminating node for Station C. The CLID information is also sent as a message along with the call. This information includes the called number (Station C), the calling number (Station A), the original called number (Station B), the original redirection reason (CFAC or NCFAC), and the redirection counter (1).
- The call is then forwarded to station D within the terminating node. The terminating node sends the call forwarding information to the originating node (Station A).
- The redirection counter is still 1 since there was a single network redirection.
- Station D answers and a message is sent notifying the originating node of this response.

Figure 118
Tandem NCFAC intranode

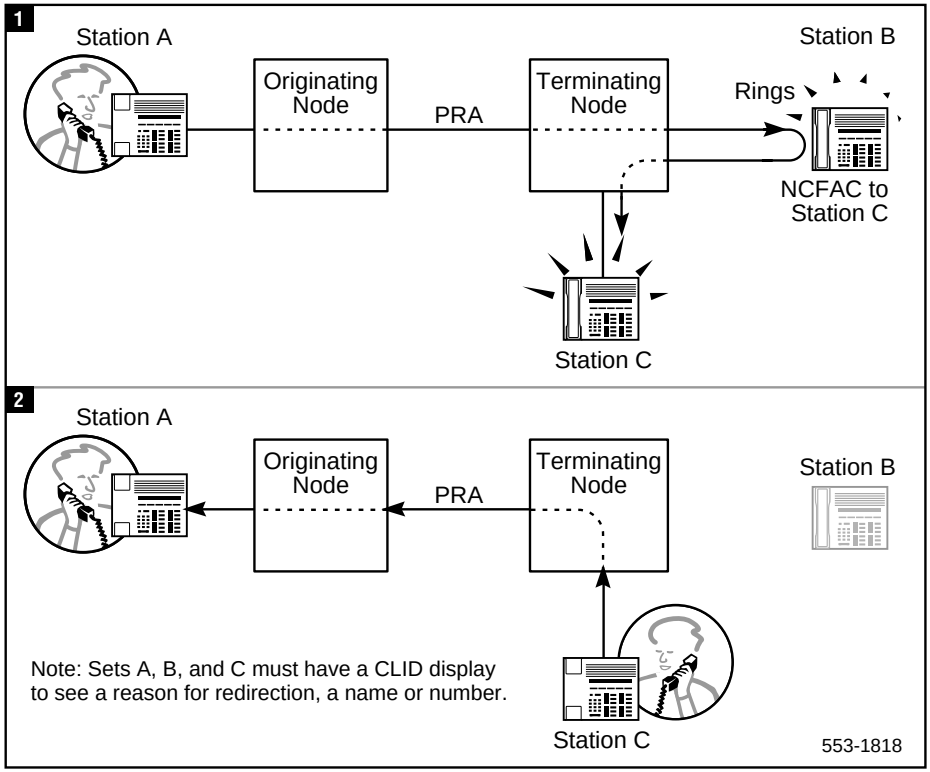


NCFNA redirection

As shown in Figure 119, the following occurs in an NCFNA redirection scenario.

- Station A generates an internode call to Station B which has the Call Forwarding No Answer feature and forwards to Station C.
- The call is transferred to Station C when the ringing (or alerting) phase times out. The terminating node sends a message to the originating node that contains the redirection number (Station C) and the redirection reason (NCFNA).
- When Station C answers the call, the terminating node generates a message to the originating node indicating this response.

Figure 119
NCFNA



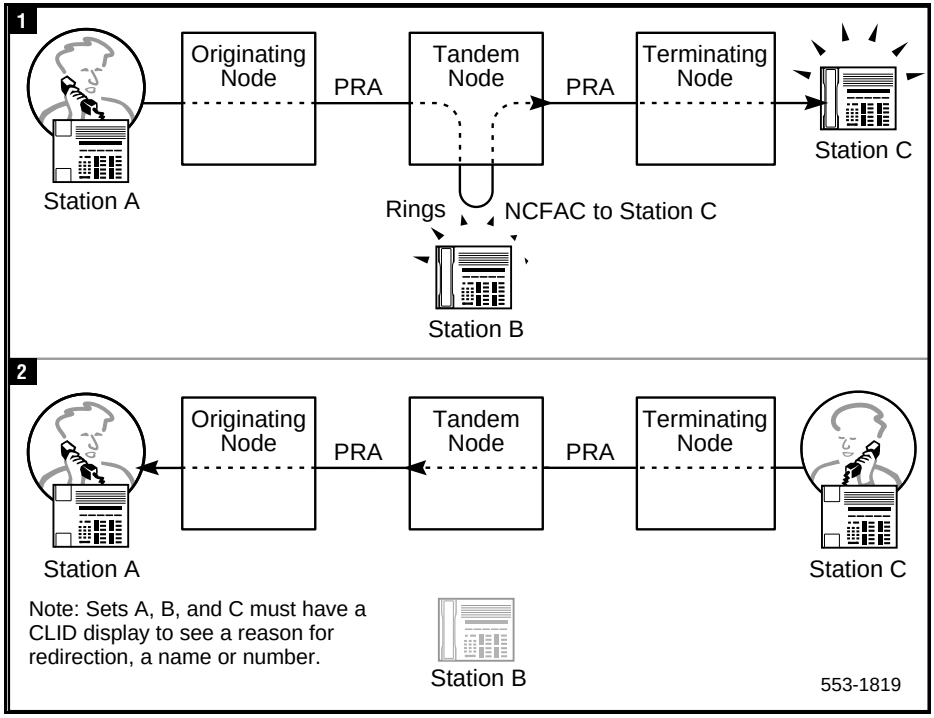
Tandem NCFNA redirection

As shown in Figure 120, the following occurs in a tandem NCFNA redirection scenario.

- Station A generates an internode call to Station B which has the Call Forwarding No Answer feature and forwards to Station C.
- The call is transferred to Station C when the ringing (alerting) phase times out.

- The message sent to the terminating node contains the called number (Station C), calling number (Station A), original called number (Station B), original reason for redirection (NCFNA), and the redirection counter with a value of 1.
- The terminating node sends a message to the tandem node which relays the message to the originating node with the redirection number (Station C) and the reason for redirection.

Figure 120
Tandem NCFNA



Operating parameters

There are no operating parameters specified for this feature.

Feature interactions

Call Forward, Break-In and Hunt Internal or External Network Wide

The treatment of a call following a call transfer (Call Forward/Hunt by Call Type) is based on the transferring set and the call originator's set. The set display on network call modification or redirection does not change.

DPNSS1 Route Optimisation/MCDN Trunk Anti-Tromboning Interworking

If Network Call Redirection is not configured in a DPNSS1/MCDN gateway, the displays are updated normally, since the RO/TAT Interworking feature is not affected.

If Network Call Redirection is not configured in an MCDN/DPNSS1 gateway, the displays are not updated on the bridged sets on the MCDN side. However, if the bridged sets are on the same node, the displays are updated, even though NCRD is not configured.

EuroISDN Trunk - Network Side

It is possible to have a set Call Forward, Call Forward No Answer or Hunt to an external number over a EuroISDN Trunk - Network Side connectivity ISDN PRI or ISDN BRI trunk. It is also possible to transfer or conference a call to an external number over a EuroISDN Trunk - Network Side connectivity ISDN PRI or ISDN BRI trunk. Access restrictions may block some transfers from being completed.

Notices of call redirection or call modification are not transmitted over a EuroISDN Trunk - Network Side connectivity.

INIT ACD Queue Call Restore

Call information associated with Network Call Redirection is lost after system initialization and call restoration.

ISDN QSIG Basic Call

When a call is terminated on the Meridian 1 and Network Call Redirection (NCR) is active, the QSIG Basic Call can still operate; however, the original called number and redirection number IE that are used by NCR will not be sent on the QSIG interface.

Feature packaging

There are no packaging requirements specified for this feature.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 15 – Forward calls to a forwarding DN.

2 LD 16 – Allow Network Call Redirection.

3 LD 95 – Display the reason calls are redirected.

4 LD 95 – Give each DN a name.

5 LD 10 – Enable the appropriate feature in the data block.

6 LD 11 – Enable the appropriate feature in the data block.

LD 15 – Forward calls to a forwarding DN.

Prompt	Response	Description
REQ:	CHG	Change existing data block.
TYPE:	CDB RDR	Customer Data Block. Call Redirection data (Gate opener).
CUST	xx	Customer number.
...		
- FNAD	FDN	Call forward no answer DID calls—Flexible CFNA DN.
- FNAT	FDN	Treatment for External CFNA calls (non-DID—when FDN is selected, CFCT handles the call.
- FNAL	FDN	Requests treatment for CFNA—when FDN is selected, DID calls are forwarded.
...		

LD 16 – Allow Network Call Redirection.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	RDB	Route Data Block.
CUST	xx	Customer Number.
ROUT	0-511	Route Number.
...		
NCNA	(NO) YES	Network Call Name is (is not) allowed.
NCRD	(NO) YES	Network Call Redirection. Allows network call redirection messages to be sent (or blocks messages if NCRD= NO) Network Call Redirection can occur without answering YES to the NCRD prompt. This prompt only controls the sending of Network Call Redirection messages, not the actual redirection of the call. The message supplied when NCRD = yes provides the information for the CLID display. When NCRD is NO, the call is redirected without the CLID redirection information.
TRO	(NO) YES	Trunk Optimization TRO economizes trunk use throughout the network as part of the NCRD feature.

LD 95 – Display the reason calls are redirected.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	CPND	Call Party Name Display data block.
CUST	xx	Customer number.
ROUT	0-511	Route Number.
...		

DES	(NO) YES	Designator for Multiple Appearance DNs allowed.
RESN	YES	Allow display of reason for redirecting calls
CFWD	(F) xxxx	Display mnemonic for (Network) Call Forward All Calls. Default is "F." Enter the mnemonic that represents NCFAC on a set's CLID display.
CFNA	(N) xxxx	Mnemonic for (Network) Call Forward No Answer display. Enter the mnemonic that represents NCFNA on a set's CLID display. Default is "N."
HUNT	(B) xxxx	Mnemonic for Network Hunting display
PKUP	(P) xxxx	Mnemonic to allow Call Pickup display
XFER	(T) xxxx	Mnemonic for Call Transfer display

LD 95 – Give each DN a name.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	NAME	Call Party Name Display name entry.
CUST	xx	Customer number.
DIG	xxx xx	An existing Dial Intercom Group number (0-253) and member number (0-99)
NAME	aaa...a	CPND name using ASCII characters. The DIG prompt is reprompted. Enter <CR> to get the DN prompt.
DN	xxxx	DN of eligible type.

LD 10 – Enable the appropriate feature in the data block.

Prompt	Response	Description
REQ:	CHG	Change.
TYPE:	500	Enter set type.

HUNT	xxxx	Hunt DN for internal calls.
FTR	EFD xxx	External Flexible call forward DN. Only allowed if LD15 is properly configured: FNAD = FDN FNAL = FDN FNAT = FDN If the DNXP package is equipped, up to 7 digits are allowed; otherwise, only 4 digits can be entered. Accepted only if CLS is MWA or FNA.
	EHT xxxx	External Hunt DN. Only allowed if CLS = CFTA. Same digits defined as above.
	FDN xxxxxxx	Flexible Call Forward No Answer DN (cannot be an LDN). Same digits defined as above.

LD 11 – Enable the appropriate feature in the data block.

Prompt	Response	Description
REQ:	CHG	Change.
TYPE:	xxxx	Enter set type.
FDN	x..x	Flexible CFNA DN where xx is the MCDN. The FDN value should include AC1/AC2 when applicable (up to 13 digits).
EFD	xxxx	Network CFNA DN for External calls.
HUNT	xxxx	Network Hunt DN for calls with CLS = CFTD.
EHT	xxxx	Network Hunt DN for External calls.

Feature operation

There are no operating procedures specified for this feature.

Network Call Transfer and Network Extended Calls

Contents

The following are the topics in this section:

Feature description 1349
Operating parameters 1349
Feature interactions 1350
Feature packaging 1350
Feature implementation 1350
Feature operation 1350

Feature description

Network Call Transfer and Attendant Extended Calls display the calling party name and number to the “Transferred to”/”extended to” party across the network. Also, if NCPND is optioned, the calling party's display is updated to show the connected party's name and number.

> ***Note:*** Network Call Transfer over PRI does not provide the ESN Network Transfer feature. This feature eliminates tandem trunk connections that double back over the same route. PRI Network Transfer merely allows calls to be blindly transferred across the ISDN network.

Operating parameters

There are no operating parameters associated with this feature.

Feature interactions

There are no feature interactions associated with this feature.

Feature packaging

This feature is included in base X11 System Software.

Feature implementation

There are no specific implementation procedures for this feature.

Feature operation

No specific operating procedures are required to use this feature.

Network Drop Back Busy and Off-hook Queuing

Contents

The following are the topics in this section:

Feature description 1351
Operating parameters 1352
Feature interactions 1353
Off-Hook Queuing 1353
Drop Back Busy 1353
Feature packaging 1353
Feature implementation 1354
Task summary list 1354
Feature operation 1356

Feature description

The Network Drop Back Busy (DBB) feature allows network calls that are blocked at a tandem node to be rerouted (dropped back) to the originating node. The calls are then directed over an alternate route. The Network Off-Hook Queuing (OHQ) feature allows Off-Hook Queuing to be configured at a tandem node, thereby allowing Off-Hook Queuing at that node.

Both DBB and OHQ give the originating node control over the routing of all outgoing network calls.

The DBB and OHQ capabilities are only supported over an ISDN network. With DBB and/or OHQ configured, an ISDN call to a tandem node may encounter the following conditions and is treated in the any of the ways described in Table 89.

Table 89
Conditions and treatments of an ISDN call to a tandem node, with DBB and/or OHQ configured

Configuration	Condition	Treatment
IDBB	All routes in initial (I) set busy	Drop back to originating node.
IDBB	All routes in “I” set and extended (E) set busy	If all routes in “I” set busy, attempt routing over “E” set. If all routes in “E” set are busy, drop back to originating node. This is the default configuration.
OHQ, IDBB	All routes in “I” set busy	Off-hook queue. If OHQ timer times out, drop back to originating node.
OHQ, IDBB	All routes in “I” set and “E” set busy	Off-hook queue to “I” set. When OHQ timer times out, attempt routing over “E” set. If all routes in “E” set are busy, drop back to originating node.

An initial set of routes (I set) are those routes in a route list which have been customer-defined for a node as being inexpensive. The system attempts to complete a call over these routes before testing for queue eligibility. An extended set of routes (E set) are those routes in a route list that are not part of the initial set. These routes are usually designated as expensive. The system attempts to complete a call over these routes only when the initial set queuing times out.

Operating parameters

There are no operating parameters specified for this feature.

Feature interactions

Off-Hook Queuing

Message Intercept

If the Message Intercept feature is equipped, a caller in an off-hook queue may receive the message intercept voice response rather than the Off-Hook Queuing tone.

Drop Back Busy

Remote Virtual Queuing

Drop Back Busy (DBB) and Remote Virtual Queuing (RVQ) are both packaged under Originating Routing Control/Remote Virtual Queuing (ORC-RVQ) package 192. If DBB and RVQ are both configured, DBB will take precedence over RVQ. If the user wishes to activate RVQ, DBB must be disabled for a route entry in response to the IDBB prompt. If the user wishes to activate DBB, it must be enabled by entering DBI or DBA. Refer to the "Feature administration" section in this feature module for more information.

Network Attendant Service

Network Attendant Service (NAS) routing takes precedence over DBB.

Feature packaging

The following packages are required for Network Drop Back Busy and Off-Hook Queuing:

- Basic Routing (BRTE) package 14;
- Network Class of Service (NCOS) package 32;
- Network Alternate Route Selection (NARS) package 58;
- Flexible Call Back Queuing (FCBQ) package 61;
- Off-hook Queuing (OHQ) package 62 for Off-Hook Queuing;
- Integrated Services Digital Network (ISDN) package 145;
- 2.0 Mb Primary Rate Access (PRI2) package 154.
- Network Attendant Service (NAS) package 159;

- ISDN Supplementary (ISDNS) package 161;
- Originating Routing Control/Remote Virtual Queuing (ORC-RVQ) package 192 for Drop Back Busy.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 87 – Allow OHQ Network Class of Service for the customer.

2 LD 86 – Configure the originating node for Remote Virtual Queuing.

Note: Drop Back Busy (DBB) and Remote Virtual Queuing (RVQ) are both packaged under the Originating Routing Control/Remote Virtual Queuing (ORC-RVQ) package 192. If DBB and RVQ are both configured, DBB will take precedence over RVQ. If the user wishes to activate RVQ, DBB must be disabled for a route entry in response to the IDBB prompt. If the user wishes to activate DBB, it must be enabled by entering DBI or DBA.

LD 87 – Allow OHQ Network Class of Service for the customer.

Prompt	Response	Description
REQ	CHG	Change
CUST	xx	Customer number
FEAT	NCTL	Network Control
SOHQ	YES	Allow system (customer) Off-hook queuing
- OHTL	nn	Off-hook queue time limit
SCBQ	(NO) YES	Allow, (disallow) system (customer) Call Back queueing
...		
NCOS	nn	Network Class of Service number. The originating telephone must have the same value.
- OHQ	(YES) NO	Off Hook Queuing (allowed) not allowed for this NCOS Both RVQ and OHQ can be enabled on a system. Only one can be activated at a time.
- CBQ	(NO) YES	Call Back Queueing allowed (not allowed) for this NCOS
- RETT	2-(10)-30	Remote Virtual Queuing Retry Timer (Time between searches, in seconds)
- RETC	4-(5)-16	Remote Virtual Queuing Retry Counter (Number of times RVQ searches the initial set before moving on to the extended set)

LD 86 – Configure the originating node for Remote Virtual Queuing.

Prompt	Response	Description
REQ	CHG	Change.
CUST	xx	Customer number.
FEAT	RLB	Route List Data Block.
RLI	nn	Route List Index.
ENTR	nn	Route List entry number.
ROUT	nnn	Route Number.
...	...	...
IDBB	(DBD)	Enter DBB (Drop Back Busy Disabled).
	DBI	This will disable Drop Back Busy, and enable Remote Virtual Queuing for the customer.
	DBA	Drop Back if Initial set is busy.
		Drop Back if all routes are busy.

Feature operation

There are no operating procedures specified for this feature.

Network Individual Do Not Disturb

Contents

The following are the topics in this section:

Feature description 1357
Operating parameters 1358
Feature interactions 1358
Feature packaging 1358
Feature implementation 1359
Task summary list 1359
Feature operation 1360

Feature description

This feature extends several functionalities of the Individual Do Not Disturb feature to operate within a network environment.

A DN in the Do Not Disturb mode is free to make calls, but appears busy to incoming calls. Incoming Direct Inward Dialing (DID) calls to a DN in the Do Not Disturb mode are intercepted to the local attendant, or the network attendant servicing the call. All other calls receive customer-defined intercept treatment defined in LD 15 (i.e., busy treatment, call routed to the attendant, or call routed to recorded announcement).

An attendant dialing a busy DN receives overflow (the DN may be on the same or different node as the attendant). The attendant may then verify whether or not the DN is in Do Not Disturb mode by pressing the IND DND key on the console; if the associated lamp remains steadily lit, it indicates that the DN is in Do Not Disturb mode. The attendant may then temporarily override Do Not Disturb by activating the Break-in feature.

Operating parameters

There are no operating parameters associated with this feature.

Feature interactions

Call Forward All Calls
Hunting

Call Forward All Calls, and then Hunting, take precedence over DNDI treatment.

Do Not Disturb - Group

An attendant may receive a visual indication of the state of a set belonging to Group Do Not Disturb mode, whether this set is located on the local node or any other network node.

Make Set Busy

The DNDI intercept treatment takes precedence over Make Set Busy indication.

Feature packaging

The following packages are required:

- Do Not Disturb Individual (DNDI) package 9;
- Attendant Break-in/Trunk Offer (BKI) package 127; and
- Network Attendant Service (NAS) package 159.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 12 – Allow the attendant to override DNDI, and configure the attendant console for DNDI.

2 LD 15 – Configure intercept treatment for DNDI.

3 LD 16 – Define the route number for DNDI RAN intercept treatment (the same route number defined in LD 15).

4 LD 14 – Define the trunks associated with the RAN route.

LD 12 – Allow the attendant to override DNDI, and configure the attendant console for DNDI.

Prompt	Response	Description
REQ	CHG	Change data.
...		
KEY		Attendant Keys.
	xx BKI	The key number on the Attendant Console assigned to Break-in to DNDI.
	xx DDL	The key number on the Attendant Console assigned for DNDI indication.

LD 15 – Configure intercept treatment for DNDI.

Prompt	Response	Description
REQ:	NEW CHG	Add new data. Change existing data.
TYPE:	INT	Intercept treatment.
...		
- DNDT		DNDI intercept treatment.

	(BST) ATT RAN	Busy tone (default). Attendant. Recorded announcement.
- - RRT		Route number for the recorded announcement, prompted only if the DNDI intercept treatment is RAN.
	0-511	For Options 51C, 61C, and 81C.
	0-127	For Option 11C.

LD 16 – Define the route number for DNDI RAN intercept treatment (the same route number defined in LD 15).

Prompt	Response	Description
REQ	CHG	Change data.
...		
RRT		Route number for the recorded announcement, prompted only if the DNDI intercept treatment is RAN.
	0-511	For Options 51C, 61C, and 81C.
	0-127	For Option 11C.
TKTP	RAN	The trunks associated with the RAN treatment.

LD 14 – Define the trunks associated with the RAN route.

Prompt	Response	Description
REQ	CHG	Change data.
...		
TKTP	RAN	The trunks associated with the RAN treatment.

Feature operation

See the Do Not Disturb feature description contained within this document.

Network Intercom (Hot Type D and Hot Type I Enhancements)

Contents

The following are the topics in this section:

Feature description 1361
Hot Type I 1362
Hot Type D Enhancement 1362
Operating parameters 1363
Feature interactions 1364
Feature packaging 1367
Feature implementation 1367
Task summary list 1367
Feature operation 1369

Feature description

Hot Line enables a designated telephone to place calls to a predetermined destination that may be internal or external to the Meridian 1. The call does not require attendant intervention. When the handset is lifted or when a preprogrammed key is activated, the system automatically dials a preprogrammed DN. Hot Lines access a set of Terminal Numbers programmed by direct entry using LD 11, or by list entry such as System Speed Call (SCC) using LD 18. Once a Hot Line call enters the ringing state, it is the same as a normal call.

There were two types of Hot Line keys (DN-based Hot Type D and Speed Call List-based Hot Type L). Enhancement introduces another type of Hot Line key, Hot Type I, while also providing improvements to the existing Hot Type D. These two improvements function in both stand-alone and network environments.

Hot Type I

An option is available with Hot Type I to provide a No Answer Indication, informing the called party that a Hot Line call was made during the called party's absence. If a Hot Line call cannot be completed on the Hot Line key, the calling party is informed via the set's display, and the call is completed over the network as a normally dialed call that attempts to terminate on the destination Prime DN.

Hot Type D Enhancement

Hot Type D provides the ability for Meridian digital sets to have two-way intercom calls on specially designated keys (not on the DN keys) with other Meridian digital sets connected to Meridian 1 PBXs across a Meridian Customer Defined Network (MCDN) Integrated Services Digital Network (ISDN). A Hot Type D call can terminate in three different modes: Voice, Ringing, and Non-ringing. With the Voice mode, speech path is automatically connected after a short ring. With Ringing and Non-ringing modes, the call must be manually answered by the called party. The difference between the two modes is that for Non-ringing no audible tone is given, but the Hot Line key flashes to indicate the call.

Hot Type D allows more than one set to have the same target DN defined for the Hot Type D key. This enhancement includes Voice, Ringing, and Non-ringing termination modes, as well as the capability to leave a No Answer Indication in some situations (i.e., the Hot Line key winks). A call terminating on an enhanced Hot Type D key operates the same as if it is terminating on a Hot Type I key (if the originating DN is the same as the target DN defined for the key). If it is not the same, but another Hot Line key exists on the set that has a target DN that matches the originating DN, a No Answer Indication is left on that key.

Note: When configuring two-way Hot Type D keys in voice mode, the fact that the CLID does not transmit the originator's Hot Type D DN between ISDN locations must be taken into account; it contains the prime DN of the originating set, and not the originator's Hot Type D DN. Therefore, ringing may occur on the Hot Type D key rather than immediate answer, since a match could not be found for the originator's Hot Type D DN. For this reason also, when the configured mode is either voice, ringing, or non-ringing, a "No Answer Indication" is not left on called set of a two-way Hotline. It is, therefore, recommended that the Hot Type I be used for a two-way Hotline, since it relies only on the prime DN.

Operating parameters

Hot Type I calls are not allowed on analog (500/2500 type) sets.

Hot Line keys cannot be defined for M3000 sets.

A Hot Line key should not be defined on a station without a Prime DN and likewise should not be defined on the primary key. If this is not done, the improved functionality will not work and the call is treated as a non-Hot Line call.

The network DN for Hot Type I and Hot Type D (when the No Answer Indication applies) must be either a Coordinated Dialing Plan or a Universal Dialing Plan number that must terminate on a Prime DN of a Meridian digital set; otherwise, the call is completed as a non-Hot Line call.

The network-wide application of Hot Type I is only applicable to nodes in a Primary Rate Interface (PRI), ISDN Signaling Link (ISL), Virtual Network Services (VNS), and Basic Rate Interface network.

If the termination mode is voice, the called party is idle, and the handsfree voice call (HVA in LD 15) is active, there is no indication to the software that the called party really answered the call. If any other key is pressed, the No Answer Indication is not left.

Hot Line keys must be defined with the same dialing plan.

Feature interactions

Attendant Blocking of DN

A Hot Type I key cannot be blocked by the attendant because it has no DN.

Pressing a Hot Type D key that is attendant blocked establishes the call on the source side of the attendant.

Auto Hold

If a user who originated a Hot Type I call receives or makes another call on another DN, pressing that DN puts the established call on hold. If a user presses the Hot Type I key while a call is established on it, the call is placed on hold. If the Hot Type I key is pressed while a call is established on another DN, the established call is put on hold. If a station with automatic hold allowed Class of Service receives a Hot Line call, the user of that station can put the active call on hold by pressing the Hot Type I key or by making or answering another call on another key.

Automatic Call Distribution (ACD)

Hot Type I calls cannot terminate on an ACD DN. A call attempting to terminate on an ACD DN receives an overflow tone. Hot Line calls involving ACD sets must use the Hot Type D option.

Busy Forward Status (BFS)

In a Secretarial Filtering scenario, the secretary's BFS lamp also will reflect that the boss's set is busy if the boss is on a Hot Type I call.

Call Forward

Hot Type I calls respect or override all kinds of Call Forward features (Busy, No Answer, All Calls, Internal, etc.) according to per-set definitions. If Call Forward is respected, the call becomes a normally dialed call, and the originator will receive the appropriate indication on their display.

Call Join

Hot Type I calls can be moved to the Conference key with the Call Join feature.

Call Park

Hot Type I calls cannot be parked.

Call Party Name Display

Hot Type I calls display names the same way as a normal call.

Hot Type I calls that become a normal call indicate on the originating station's display that the call is no longer a Hot Line call.

Call Pickup

Hot Type I calls cannot be picked up. An attempt to pick up a Hot Type I call results in an overflow tone.

Call Transfer

Hot Type I calls may be transferred to another Hot Line key or to a normal DN key; likewise calls on a normal DN key may be transferred to a Hot Line key.

Conference

A Conference call may involve a mixture of intercom and regular DN keys.

Display Key

Hot Type I calls are supported by the Display key feature; pressing the Display key and then the Hot Type I key will show the target DN on the originating station's display.

Do Not Disturb (DND)

Hot Type I calls ignore the Do Not Disturb feature. Hot Line calls are presented to the defined target, even when DND is activated.

Flexible Feature Code (FFC) Boss Secretarial Filtering

Hot Type I calls override this feature (i.e., Hot Type I calls are not filtered by FFC Boss Secretarial filtering). The call terminates on the Boss' set and is not forwarded to the secretary.

FFC Boss Secretarial Filtering takes precedence over enhanced Hot Type D calls. In this case, if FFC Boss Secretarial Filtering is active, calls terminate on the secretary's set.

Last Number Redial

A Hot Line key cannot be redialed using the Last Number Redial feature.

Make Set Busy

Hot Type I calls terminating on a station in the Make Set Busy mode override Make Set Busy.

Multiple Appearance Redirection Prime (MARP)

If more than one set is allocated the same prime DN, the Hot Type I call will terminate on the set designated as the Multiple Appearance Redirection Prime (MARP). If the MARP DN is not the prime DN on the set, or if the set designated as the MARP DN is not a Meridian digital set, the first Meridian digital set with the prime DN will be used. If none of these conditions are met, the call will terminate as a non-Hot Line call, and the calling party will be notified on the display.

Hot Type D calls can have voice termination only on a MARP Terminal Number (TN), or if there is no MARP TN, then on the first TN in the TN list. A No Answer Indication for Hot Type D can only be left on the MARP TN, or if there is no MARP TN, then on the first TN in the TN list.

Override

An internal Hot Type I call never returns busy, unless the call became a non-Hot Line call due to the Hot Line key being busy. In this case, the call behaves like a normally dialed call, and Override can be used upon receipt of a busy signal.

Ring Again

Hot Line calls terminating on a busy key become normal calls. Hence, they may use the Ring Again feature under normal circumstances.

Ring Again – No Answer

If Ring Again No Answer is activated for a Hot Type I call, it is activated as though the call had been dialed normally.

Ringing Change Key

The ringing/non-ringing mode of an enhanced Hot Type D or of a Hot Type I key is not changeable by using the Ringing Change Key feature.

Vacant Number Routing

Hot Type I keys and enhanced Hot Type D keys support Vacant Number Routing.

Feature packaging

The following packages are required for Network Intercom (Hot Type D and Hot Type I Enhancements):

- The Network Intercom (Hot Type D and Hot Type I Enhancements) feature is included in Enhanced Hot Line (HOT) package 70.

For Hot Type I in an ISDN network the following packages are required:

- Integrated Services Digital Network (ISDN) package 145;
- Advanced ISDN Network Services (NTWK) package 148;
- at least one of Integrated Services Digital Network Signaling Link (ISL) package 147; ISDN Primary Rate Access (PRA) package 146; 2.0 Mb Primary Rate Interface (PRI2) package 154; Virtual Network Services (VNS) package 183; ISDN BRI Trunk Access (BRIT) package 233.

DNPSSS1 connectivity for Hot Type D requires:

- Integrated Digital Access (IDA) package 122 and
- Digital Private Signaling System 1 (DPNSS) package 123.

R2MFC connectivity for Hot Type D requires Multifrequency Compelled Signaling (MFC) package 128.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 11 – Define Hot Type D and I keys and Classes of Service as follow.

2 LD 95 – Configure the Calling Party Name Display

When configuring two-way Hot Type D keys in voice mode, it must be taken into account the fact that the CLID does not transmit the originator's Hot Type D DN between ISDN locations; it contains the prime DN of the originating set, and not the originator's Hot Type D DN. Therefore, ringing may occur on the Hot Type D key rather than immediate answer, since a match could not be found for the originator's Hot Type D DN.

For this reason also, when the configured mode is either voice, ringing, or non-ringing, a “No Answer Indication” is not left on the called set of a two-way Hotline. It is, therefore, recommended that the Hot Type I be used for a two-way Hotline, since it relies only on the prime DN.

LD 11 – Define Hot Type D and I keys and Classes of Service as follow.

Prompt	Response	Description
REQ:	NEW CHG	Add new data. Change existing data.
TYPE:	aaaa	Telephone type where aaaa cannot = M3000.
TN	l s c u	Terminal Number.
	c u	For Option 11C.
...		
CLS	FICA (FICD) NAIA (NAID)	Forward Hot Type I allowed. Forward Hot Type I denied. No Answer indication allowed. No Answer indication denied.
...		

KEY	nn HOT D dd target_num hot_dn	Two-way Hot Line type D Key. nn = key number. dd = number of digits dialed. target_number = terminating DN (31 digits maximum). Hot_dn = two-way Hot Line DN.
		Termination mode:
	R	Ringing
	V	Voice
	N	Non-ringing
	(H)	Hot Line
KEY	nn HOT I dd target_number	Hot Line type I key. nn = key number. dd = number of digits dialed. target_number = terminating DN (31 digits maximum).
		Termination mode:
	(V)	Voice
	N	Non-ringing
	R	Ringing

LD 95 – Configure the Calling Party Name Display

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	CPND	Calling Party Name Display.
CUST	xx	Customer number.
...		
- NITC	aaaa (NI)	Non-Hot Line call. Indicates that the Hot Line call terminated as a normal call.

Feature operation

Press the Hot Type I or D key to initiate a Hot Line call to a target DN (the DN may be an external DN in an MCDN ISDN network).The called party answers the call by pressing their Hot Type I or D key if configured. If the called party has no Hot Type I or D key configured, the call will behave as a normal call and is answered accordingly.

If the called party does not answer and has No Answer Indication Allowed Class of Service, the Hot Type I or Hot Type D key will be winking as a form of No Answer Indication.

Network Message Services

Contents

The following are the topics in this section:

Feature description 1371
Network Message Services—Message Center 1373
Network Message Services—Meridian Mail 1374
Operating parameters 1374
Feature interactions 1375
Feature packaging 1376
Feature implementation 1378
Task summary list 1378
Feature operation 1382

Reference list

The following are the references in this section:

Message Center: Description and Operation (553-2691-100)

Feature description

Network Message Services (NMS) uses ISDN signaling capabilities to provide messaging services across an ISDN network. Meridian 1 systems interconnected with PRI or ISL can extend supported message services to all users within that network on a customer basis from a single, central location. Access to NMS and feature activation from the messaging system is transparent to the end user.

A second distinct application, NMS-Meridian Mail (NMS-MM), is introduced to provide end-user and calling party access to centralized Meridian Mail services across the network.

NMS functions common to both applications are described here and details specific to each are described later in this module. Differences between Message Center and Meridian Mail functions are described under their respective headings.

Within NMS operations, there are direct message calls and indirect message calls:

- Direct calls are initiated by the user accessing the Message Center to receive messages. Access is allowed by dialing the message facility directly or using the Message Waiting Key (MWK).
- Indirect calls occur when a redirection feature directs the call to a Message Center so the caller can leave a message.

An NMS call has two components: basic PRI call signaling and transaction signaling. The PRI portion of the call is supported by ISDN PRI or ISL and Network Call Redirection (NCRD)—subject to the requirements for PRI calls and the NCRD feature. NMS always uses non-call-associated, connectionless Transaction Signaling messages to turn on/off the user set Message Waiting Indication (MWI) and to transport call information for certain Meridian Mail features, including Call Sender (that is, the transport of connectionless signaling information across the ISDN network).

There are three types of network nodes supporting NMS:

- Originating node. For direct calls, the originating node is the PBX where the calling party resides. For indirect calls, the originating node is the node where the originally dialed party resides.
- Tandem node. This switch can pass transaction signaling messages on to the next PBX. Stations on a tandem node do not have access to Network Message Services functionality.
- Terminating node. This is the PBX where the Message Center or Meridian Mail server resides, and where the call terminates.

NMS supports Coordinated Dialing Plans (CDPs) and Uniform Dialing Plans (UDPs). All nodes must conform uniformly to the adopted dialing plan. NMS does not support mixed CDP/UDP across a network and limits CDP support to Distant Steering Codes.

Network Message Services—Message Center

Network Message Services-Message Center (NMS-MC) allows a caller transparent access to a centralized message center over an ISDN PRI/ISL network.

These Message Center configurations are supported:

- ACD Message Center
- DN Message Center
- Attendant Message Center

For these types of Message Centers, the Message Indication Key (MIK) on a message taker's set is used to turn on Message Waiting Indication at a user telephone. The Message Cancellation Key (MCK) is used to turn off Message Waiting Indication.

The NMS-MC supports direct and indirect NMS-MC access across ISDN. Direct access is initiated by dialing the Message Center DN or pressing the Message Waiting Key (MWK). Indirect access occurs when a call is presented to the NMS-MC by any of the call redirection features supported by Network Call Redirection (NCRD) including

- Network Call Forward All Calls
- Network Call Forward No Answer
- Network Call Forward Busy
- Network Hunting

See the NCRD module in this document for further details.

Network Message Services—Meridian Mail

NMS-MM provides transparent access to the Meridian Mail system across the network. NMS-MM operates only between system machines supported by a single Meridian Mail server facility. Users on remote nodes configured as part of the NMS-MM server base have access to all the Meridian Mail features available on the local switch.

See the NCRD module when you consider the redirections that apply to your particular environment. Since Message Center support is on a customer-by-customer basis, configure your network accordingly. See *Message Center: Description and Operation* (553-2691-100). In Meridian Mail applications, different network PBXs (nodes) must be configured with the same Meridian Mail server for proper messaging support. See the Meridian Mail suite of NTPs.

Direct calls for NMS-MM are initiated by dialing the message facility directly or pressing MWK on a properly programmed telephone. Functionality mimics current operations, including Auto-login with a user's password. See the appropriate NTP for a description of call functions.

Indirect calls are presented to the Meridian Mail server from call redirection services. NMS-MM relies on Network Call Redirection (NCRD) to provide the originally dialed and calling party numbers to the Meridian Mail server for message processing. NMS-MM supports Off-net Access through direct dialing.

> ***Note:*** Option 11C systems may utilize this feature; however, only as an originating site or a tandem node, not as the location which actually possesses the Meridian Mail hardware (i.e. the terminating node).

Operating parameters

The following list describes the NMS operating parameters:

- Password Suppression is not supported across a Meridian 1 network.
- Packet Transport Equipment Meridian Mail (MP) is not supported.
- Multiple Message Center interworking is not supported.
- PRI or ISL is needed for both direct and indirect Message Center calls.

- The NMS DN must be unique and still be able to be reached by means of PRI or ISL from all NMS users in the network, and vice versa.
- NMS supports Meridian 1 to Meridian 1 connections only.
- The local NMS-MM DN defined in each node must also be configured in the Meridian Mail server database, in the VSDN table.
- In-band End-to-End Signaling (EES) is required for NMS-MM at terminating and originating nodes.
- NMS-MM requires the Meridian Hospitality Voice Services package to provide link recovery enhancements for Meridian Link ISDN/AP.
- NMS-MM does not support international dialing.
- Only one Message Center DN can be defined for a telephone. Multiple Message Center types are not supported.
- The NMS does not support Trunk Steering Codes (TSCs).

Feature interactions

Listed here are differences in networking applications which may impact Network Message Services operations.

Password Suppression

Password Suppression is not supported across a Meridian 1 network.

Network Call Redirection (NCRD)

Indirect access to the NMS-Meridian Mail (NMS-MM) application is based on the NCRD package, which is broken down into the following areas:

- Call Forward All Calls and Call Forward No Answer and Call Forward Busy, Network Call Transfer, and Network Hunting provide the base for NMS indirect access.
- Attendant Extended Call presents the same information to Meridian Mail as Network Call Transfer except that the DN Update message is sent to the NMS-MM when the attendant releases the call. The connected party number is updated only when the attendant is released.

- NMS does not support incoming calls from CO Loop Start trunks. Calls that come into the switch from a CO Loop Start trunk cannot be redirected to another trunk by means of attendant extension or call redirection; these calls are blocked when redirection is activated.

Barge-in Attendant

The attendant can barge-into an NMS-MM call at the terminating PBX. During barge-in, the user cannot use features that require switch effort, such as the Call Sender feature.

Trunks

When a call is presented to the NMS-MM by means of a non-PRI or ISL trunk, the call is treated as an external call even if it is an on-network call. The external greeting is applied and the message is announced as from an external number.

Meridian Hospitality Voice Services

NMS-MM requires the Meridian Hospitality Voice Services (MHVS) package to provide Meridian Link ISDN/AP protocol recovery treatment for link applications. All calls to the ACD Night Call Forward (NCFW) DN are redirected to the Meridian Mail server when the ISDN/AP link fails. Call treatment in NMS-MM is identical to the NCFW treatment.

ISDN requires that the network be equipped with either Coordinated Dialing Plan (CDP) or a Uniform Dialing Plan (UDP) throughout, but it does not support a mixture of both.

Feature packaging

The package requirements for Network Message Services-Message Center are different for each node.

The following packages are required for an NMS-Message Center originating node:

- End-to-End Signaling (EES) package 10;
- Basic Automatic Call Distribution (BACD) package 40;
- Automatic Call Distribution Package A (ACDA) package 45;
- Message Center (MWC) package 46;

- ISDN Signaling (ISDN) package 145;
- ISDN Primary Rate Interface (PRI) package 146 **or** ISDN Signaling Link (ISL) package 147 **or** 2.0 Mb Primary Rate Access (PRI2) package 154;
- Advanced Network Services (NTWK) package 148;
- Network Message Services (NMS) package 175.

The following packages are required for an NMS-Message Center tandem node:

- ISDN Signaling (ISDN) package 145;
- ISDN Primary Rate Interface (PRI) package 146 **or** ISDN Signaling Link (ISL) package 147 **or** 2.0 Mb Primary Rate Access (PRI2) package 154;
- Network Message Services (NMS) package 175.

The following packages are required for an NMS-Message Center terminating node:

- End-to-End Signaling (EES) package 10;
- Basic Automatic Call Distribution (BACD) package 40;
- Automatic Call Distribution Package A (ACDA) package 45;
- Message Center (MWC) package 46;
- ISDN Signaling (ISDN) package 145;
- ISDN Primary Rate Interface (PRI) package 146 **or** ISDN Signaling Link (ISL) package 147 **or** 2.0 Mb Primary Rate Access (PRI2) package 154;
- Advanced Network Services (NTWK) package 148;
- Network Message Services (NMS) package 175.

  Note: BACD (package 40) and ACDA (package 45) may not be required for your particular Message Center application.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 17 – Define the software release of each switch at the far end of each D-channel in the NMS network

2 LD 15 – Enable Message Services.

3 LD 16 – Create an ISDN transport signaling database.

4 LD 23 – Define Meridian Mail ACD group in the remote switch (NMS-MM only).

5 LD 10 – Define Network Message Services DN for each analog (500/2500 type) telephone.

6 LD 11 – Define Network Message Services DN for each digital (Meridian 1) telephone.

All of these procedures apply to both NMS-MM and NMS-MC except for Overlay 23, which is Meridian Mail only. See Table 90 for NMS DN information.

LD 17 – Define the software release of each switch at the far end of each D-channel in the NMS network

Prompt	Response	Description
REQ	CHG	Change.
TYPE	ADAN	Configuration Record.
ADAN	CHG DCH x	Change D-channel information. x = 0-63.
- RLS	xx	Enter the X11 release of the far end.

LD 15 – Enable Message Services.

Prompt	Response	Description
REQ:	CHG	Change.
TYPE:	IMS	Integrated Messaging Service.
CUST	xx	Customer number.
IMS	YES	Change Integrated Message System.
- IMA	YES	Enable Integrated Message System.

LD 16 – Create an ISDN transport signaling database.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	RDB	Route Data Block.
CUST	xx	Customer number.
ROUT	xx	Route Number.
- ISDN	YES	ISDN option.
- - PNI	1-32700	Customer private identifier—unique to a customer. This is the private identifier of the target switch and must be the same number used for PNI in LD15 for remote customer. Matches PNI in LD16 at remote to PNI in LD15 at local site.
- NCRD	YES	Network Call Redirection
- - TRO	YES	Trunk Route Optimization allowed (denied) on the route.
- INAC	(NO) YES	Insert Access Code. INAC = YES is required for ISDN network features. This prompt only appears if the route type is a TIE trunk.

LD 23 – Define Meridian Mail ACD group in the remote switch (NMS-MM only).

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	ACD	Automatic Call Distribution data block.
CUST	xx	Customer number.
ACDN	x..x	The Meridian Mail DN.
MWC	YES	Message Center services.
MAXP	xxxx	Maximum number of agent positions.
...		
NCFW	x..x	Night Call Forward DN, where x...x is the NMS-DN. If network DN, include AC1/AC2. Do not define any ACD agents for this ACD group to allow automatic redirection to the ACD Night Call Forward DN (NFCW).

LD 10 – Define Network Message Services DN for each analog (500/2500 type) telephone.

Prompt	Response	Description
REQ:	CHG	Change.
TYPE:	500	Type of set.
TN	l s c u	Terminal Number
	c u	For Option 11C.
DIG	0-253 0-99	Dial Intercom Group number and Member number.
CLS	MWA	Class of Service
FTR	FDN x..x	Flexible Call Forward No Answer NMS-DN, x..x is the NMS-DN. The NMS-DN may be the local or the network DN. If network DN, include AC1/AC2.

LD 11 – Define Network Message Services DN for each digital (Meridian 1) telephone.

Prompt	Response	Description
REQ:	CHG	Change.
TYPE:	aaaa	Type of set.
...		
FDN	x..x	Flexible Call Forward No Answer NMS-DN. The NMS-DN may be the local or the network ACD DN.
CLS	CFTA HTA	Class of Service required to define EFD and EHT.
...		
EFD	x..x	Call Forward by Call Type - External No Answer to NMS-DN.
HUNT	x	Hunt to NMS-DN.
EHT	x x	Call Forward by Call Type - External Hunt to NMS-DN.
...		
KEY	xx MWK x...x	Message Waiting key, where x..x i s the NMS-DN. The NMS-DN may be the local or the network ACD DN.

Table 90
Network Message Services DN (applies to both NMS- MC and NMS- MM)

Call type	Network Message Services DN (NMS- DN)	Number of digits
Private call using Uniform Dialing Plan (UDP)	ACC + LOC + XXXX	8 to 9
Private call using Coordinated Dialing Plan (CDP)	DSC + X..X	10 maximum
Public numbering plan	ACC + (1) + NPA + NXX + XXXX ACC + (1) + NXX + XXXX	14 maximum

Feature operation

There are no operating procedures specified for this feature.

Network Ring Again

Contents

The following are the topics in this section:

Feature description 1383
Operating parameters 1384
Feature interactions 1386
Feature packaging 1387
Feature implementation 1387
Task summary list 1387
Feature operation 1389

Feature description

Network Ring Again (NRAG) provides ring again capability within an MCDN PRI/ISL network, or across an ECMA-QSIG or DPNSS1 gateway. NRAG allows a caller at one location to activate Ring Again against a terminating station that is busy at another location.

The NRAG feature operates in “free notification” mode. This means the terminating switch determines when the called party becomes idle and notifies the originating switch.

Once the NRAG feature has been activated, the status of the called party is observed until the line is idle and a new call set-up can be attempted, or until NRAG is deactivated by a timeout or manually disconnected by the caller.

NRAG operates as follows: station A makes a call across an MCDN network, ECMA-QSIG, or DPNSS1 gateway to busy station B. Station A can activate NRAG against station B. When station B becomes idle, free notification is sent to telephone A. Station A may then press the Ring Again (RGA) key to call station B.

Note: If station B has activated Call Forward All Calls to station C, and station C is busy, station A can activate NRAG against station C, if station C is located in the same node as station B.

If a Multiple Appearance Redirection Prime (MARP) is configured for station B, the MARP rules for redirection are applied, with the MARP TN being used to check whether Call Forward All Calls is active. If MARP is not configured, but station B has a Multiple Appearance DN, the first TN from the DN block found to have Call Forward All Calls is used.

When more than one caller activates NRAG on a terminating station, the calls are queued on a first-come, first-served basis. When the called station becomes idle, only the first caller in the queue is signaled. The second caller in the queue is signaled only after the Queue Advance Timer (four seconds) expires.

Operating parameters

NRAG cannot be activated on an Automatic Call Distribution (ACD) termination, because ACD users are serviced by the ACD queue.

Only Call Forward All Calls is supported; any other type of redirection is not supported (including Call Forward All Calls in two or more steps).

Call Forward All Calls is only supported to DNs on analog (500/2500 type) or Meridian digital sets.

If the terminating station presses the RGA key after receiving free notification, and station B has de-activated Call Forward All Calls in the meantime, station B is rung.

NRAG requires a number of timers to control the feature functions on both the originating and terminating switches. Tables 91 and 92 show the values defined and which timers are used by the Meridian 1.

Table 91
Originating Switch Timers

Timer code	Description	Duration
T2	Period for unanswered recall notify	30 seconds
T5	Message Response Timer	4 seconds
T6	Duration Timer	30 minutes
TR2	Recall Suspend Option Timer	9 minutes
Note: TR2 not applicable to Meridian 1		

Table 92
Terminating Switch Timers

Timer code	Description	Duration
T7	Duration Timer	30 minutes
GT	Guard Timer	6 seconds
QAT	Queue Advance Timer	4 seconds
Note: GT is not applicable to Meridian 1.		

Feature interactions

Make Set Busy

NRAG can be originated by a station in the Make Set Busy (MSB) Mode. It can also be activated against a station in the MSB Mode, assuming no Call Forward All Calls DN.

Do Not Disturb

Ring Again, originating from a station with Do Not Disturb (DND) active, is supported; however, NRAG cannot be activated against a terminating station which has DND activated.

Call Waiting
Camp-On

If Call Waiting or Camp-On is active on the terminating station, no notification will be sent to the originating party until the terminating station becomes idle.

Call Forward All Calls

If the originating station activates Call Forward All Calls (CFAC) after activating NRAG, NRAG can still be received.

Data calls

NRAG is supported for data calls.

Calling Line Identification

NRAG is supported only if the Calling Line Identification (CLID) uses the prime DN.

Incoming Digit Conversion

If there is any conversion done to the called DN, NRAG is not supported.

ISDN QSIG Basic Call

Network Ring Again signaling is supported within the Meridian Customer Defined Network only. Network Ring Again requests which go through the QSIG interface will not be supported.

CDP and NARS

For networks with CDP and NARS using the same route, turn off INAC and insert a DMI when needed.

Feature packaging

The following packages are required for Network Ring Again:

- Background Terminal (BGD) package 19;
- ISDN signaling (ISDN) package 145;
- Network Ring Again (NRAG) is package 148;

and one of the following:

- ISDN Primary Rate Interface (PRI) package 146; or
- 2.0 Mb ISDN Primary Rate Interface (PRI) package 154; or
- ISDN Signaling Link (ISL) package 147; which, if ISL is over DTI/DTI2, requires:
  - — 1.5 Digital Trunk Interface (PBXI) package 75; or
  - — 2.0 Mb Digital Trunk Interface (DTI2) package 129

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 17 – Define the software release ID.

2 LD 15 – Set up Private Network Identifier (PNI) mapping between call type translator HLOC, LSC, HNPA, or HNXX for proper CLID construction.

3 LD 16 – Set up duration timer (NRAG), Private Network Identifier (PNI), insertion of ESN Access Codes (INAC).

LD 17 – Define the software release ID.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	CFN	Configuration Record.
- ADAN	NEW DCH x	Add a primary D-channel, x = 0-63.

- CTYP	DCHI MSDL	Card type.
- DNUM	0-15	Device number: physical port (odd) for D-channel on DCH, physical card address for MSDL.
- PORT	0-3	Port number on MSDL card.
RLS	xx	Release ID of the switch at the far end of the D-Channel.

LD 15 – Set up Private Network Identifier (PNI) mapping between call type translator HLOC, LSC, HNPA, or HNXX for proper CLID construction.

Prompt	Response	Description
REQ:	CHG	Change.
TYPE:	NET	Networking Data.
CUST	xx	Customer number.
- OPT	aaa	Options
- AC2	aaa	Access Code 2. Enter call types (type of number) that use access code 2. Multiple call types can be entered. Default is to access code 1.
- ISDN	YES	Change ISDN options
- PNI	1-32700	Customer private identifier—unique to a customer. Within one network, use the same value for PNI in both the Customer Data Block (LD15) and the Route Data Block (LD16) in all PBXs.
	100-999	Area code for the Meridian 1 system.
	100-999	Prefix for the Central Office.
	100-999	Home Location Code (NARS).
	1-9999	1- to 4-digit Local Steering Code established in the Coordinated Dialing Plan (CDP). The LSC prompt only appears if user has a 5- or 6-digit dialing plan.
...		

LD 16 – Set up duration timer (NRAG), Private Network Identifier (PNI), insertion of ESN Access Codes (INAC).

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	RDB	Route Data Block.
...		
CNTL	(NO) YES	Changes to controls or timers.
TIMR	NRAG (30)-240	Network Ring Again duration timer (T6 and T7 timers)—time is in minutes. Currently, only a value of 30 minutes is supported. Package 148, Advanced ISDN Features, is required.
...		
INAC	(NO) YES	Insert Access Code. Permit an ESN access code to be automatically added to an incoming ESN call from a private network. If INAC is YES, the digit insertion option (INST) is bypassed. This prompt only appears if the route type is a TIE trunk.
PNI	1-32700	Customer private identifier—unique to a customer. Within one network, use the same value for PNI in both the Customer Data Block (LD15) and the Route Data Block (LD16) in all PBXs.

Feature operation

There are no operating procedures specified for this feature.

Network Signaling on Virtual Network Services

Contents

The following are the topics in this section:

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Feature description 1392
Scenarios involving Satellite (SAT) Routes 1393
Operating parameters 1395
Feature interactions 1397
Feature packaging 1397
Feature implementation 1397
Task summary list 1397
Feature operation 1398

Regional material statement

The information presented in this section does not pertain to all market regions. Contact your system supplier or your Nortel Networks representative to verify support of this product in your area.

Feature description

The Network Signaling on Virtual Network Services (NSIG on VNS) feature enhances the functionality of Virtual Network Services by supporting Network Signaling on the VNS D-Channel (VNS_DCH).

With VNS, the Public Switched Telephone Network (PSTN) trunk serves as a B-Channel. However, NSIG is not allowed over PSTN trunks; therefore, it is necessary to send NSIG over the D-Channel in order to maintain the Network Class of Service (NCOS) information.

NCOS information is transported via Network Signaling over routes, depending on the value of the Signaling arrangement (SIGO) prompt in the Route Data Block. When SIGO = STD, no NCOS information is sent on the Bearer Channel (B-Channel).

The value of the Virtual Signaling (VSIG) prompt in Overlay 17 determines whether or not NSIG is supported on the VNS D-Channel. When VSIG = NO, NSIG is not sent over the VNS D-Channel. When VSIG = YES, NSIG is sent over the VNS D-Channel, and the standard ESN5 protocol is used.

VSIG = YES and SIGO is set to STD

In this situation, NSIG is configured on the VNS D-Channel. Two nodes are connected by a VNS D-Channel, and the bearers are TIE trunks connected to the Central Office (CO). When Set A initiates a call to Set B, using the VNS D-Channel, the NCOS of Set A travels over the VNS D-Channel using ESN5 protocol and is present at the terminating node for further access restrictions. No Network Signaling is on the bearer in this case.

VSIG = YES and SIGO is not set to STD

In this situation, NSIG is configured on the VNS D-Channel and on the bearer. When Set A initiates a call to Set B, the NCOS of Set A travels over the VNS D-Channel and on the bearer.

VSIG = NO and SIGO is not set to STD

In this situation, NSIG is not configured on the VNS D-Channel. When Set A initiates a call to Set B, no NCOS information travels over the VNS D-Channel, but will travel on the bearer.

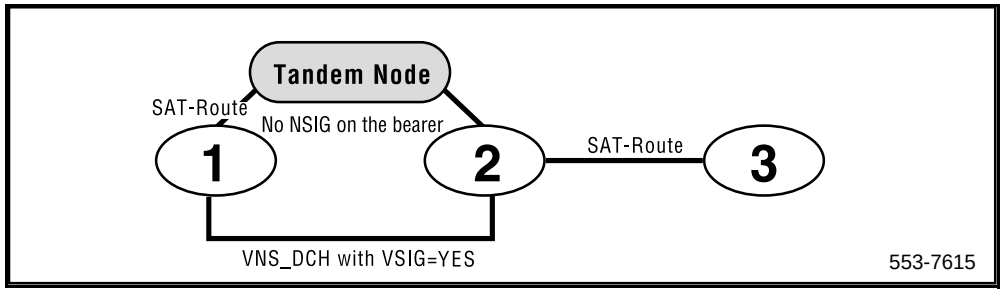
Scenarios involving Satellite (SAT) Routes

When Satellite Routes are involved, NSIG on VNS behaves as shown in the following scenarios.

VSIG = NO and SIGO is not set to STD

Referring to Figure 121, a call from Node 1 to Node 3 passes a Satellite Route. The route between Node 2 and Node 3 is also a Satellite Route; therefore, the call is blocked at Node 2.

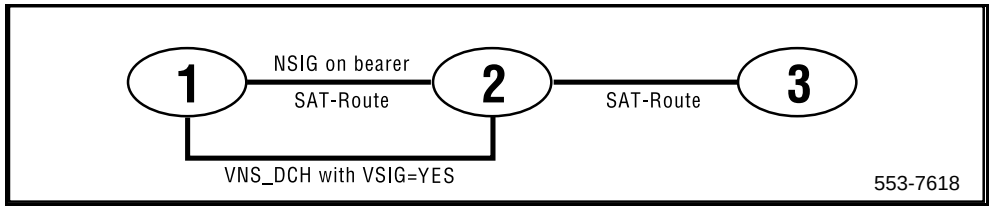
Figure 121
A scenario involving two SAT-Routes where VSIG = NO and SIGO is not set to STD



VSIG = YES and SIGO is not set to STD

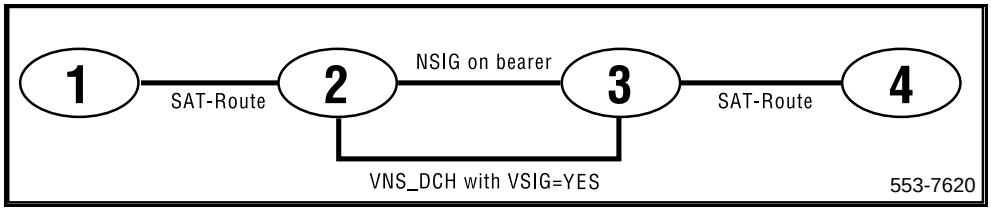
Referring to Figure 122, a call from Node 1 to Node 3 passes a Satellite Route. The route between Node 2 and Node 3 is also a Satellite Route; therefore, the call is blocked at Node 2. The Satellite information is transported over the bearer.

Figure 122
A scenario involving two SAT-Routes where VSIG = YES and SIGO is not set to STD



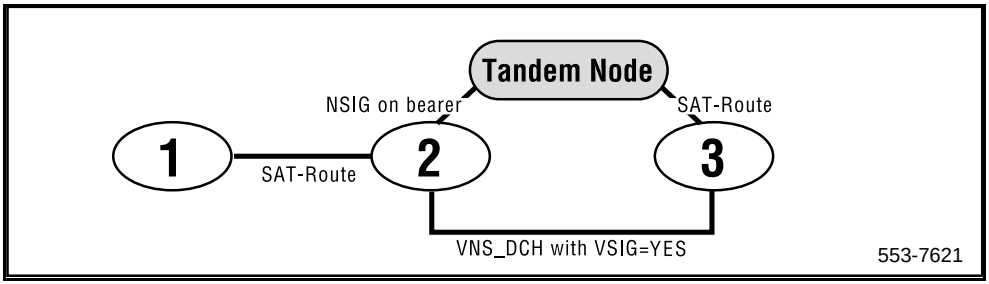
Referring to Figure 123, a call from Node 1 to Node 4 passes a Satellite Route. The Satellite Count is updated at Node 2, and the Satellite information is sent to Node 3. The route between Node 3 and Node 4 is also a Satellite Route; therefore, the call is blocked at Node 3.

Figure 123
A scenario involving two SAT-Routes where VSIG = YES and SIGO is not set to STD



Referring to Figure 124, a call from Node 1 to Node 3 is initiated, and the call is blocked at the Tandem Node. In this scenario, the Satellite information is sent from Node 2 to the Tandem Node. The route between the Tandem Node and Node 3 is also a Satellite Route; therefore, the call is blocked on the bearer side of the Tandem Node.

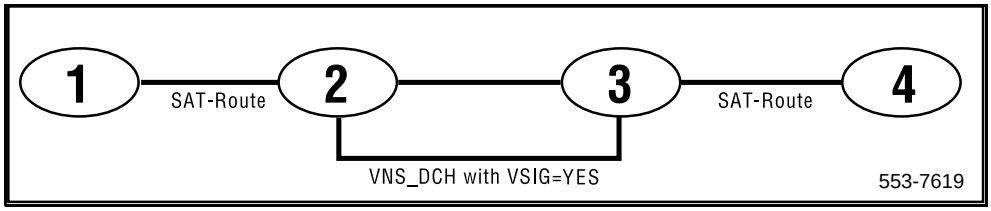
Figure 124
A scenario involving two SAT-Routes where VSIG = YES and SIGO is not set to STD



VSIG = YES and SIGO is set to STD

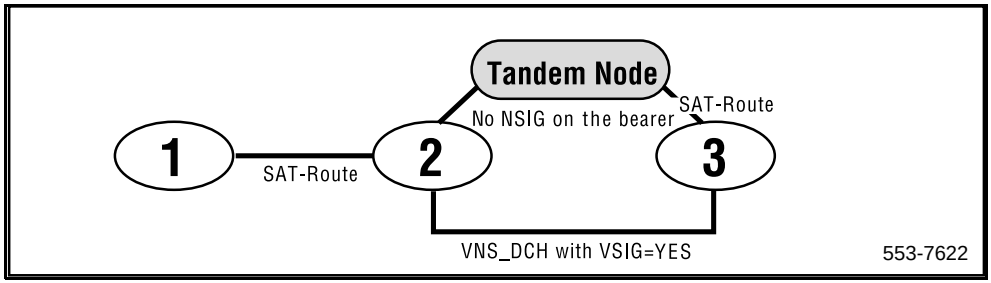
Referring to Figure 125, a call from Node 1 to Node 4 passes a Satellite Route, and the Satellite Count is updated at Node 2. The Satellite information travels over the VNS D-Channel to Node 3. The route between Node 3 and Node 4 is also a Satellite Route; therefore, the call is blocked at Node 3.

Figure 125
A scenario involving two SAT-Routes where VSIG = YES and SIGO is set to STD



Referring to Figure 126, if NSIG is not configured on the bearer side, the Satellite information is not sent over the bearer. A call from Node 1 to Node 3 passes even if there is a second Satellite Route involved in the call. At Node 3, the only Satellite information received is that which is received over the VNS D-Channel.

Figure 126
A scenario involving two SAT-Routes where VSIG = YES and SIGO is set to STD



Operating parameters

This feature does not support Call-Back Queuing.

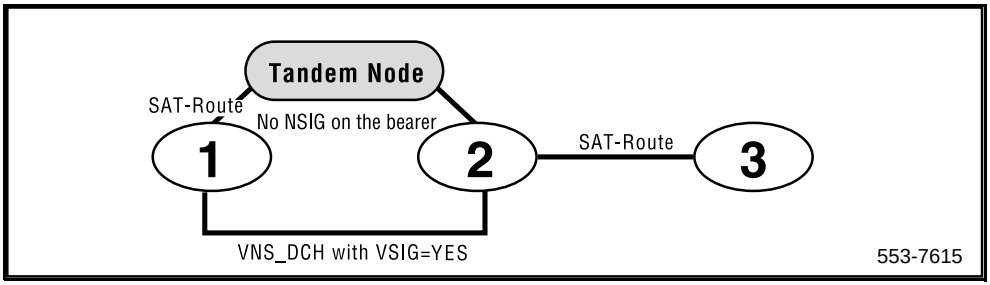
When the NSIG on VNS feature is disabled, the previous functionality exists. In this case, no signaling digits are sent over the VNS D-Channel. However, if configured, NSIG is transported over the bearer.

A non-symmetric configuration is supported for bearer trunks.

The VNS D-Channel only supports the NSIG ESN5-protocol. It does not support EN19 and ETN protocols.

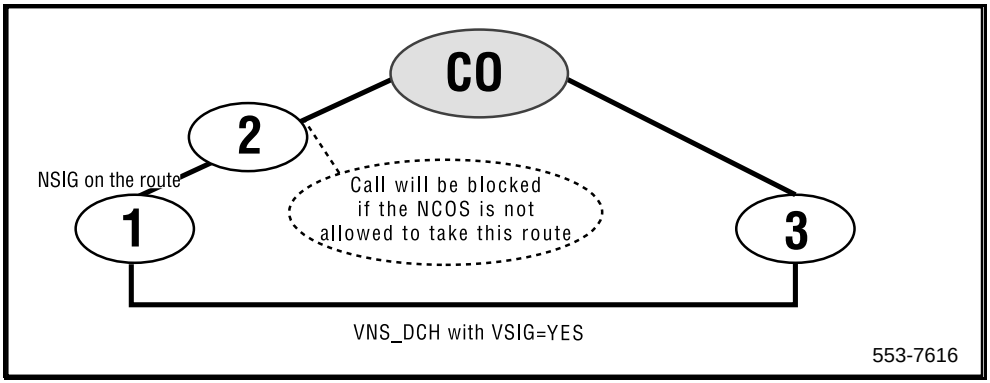
Referring to Figure 127, when NSIG is configured only on the VNS D-Channel, the Satellite Count is not updated if a Satellite Route is passed on the bearer side. A call from Node 1 to Node 3 passes even when there are two Satellite Routes involved in the call. When no NSIG information is sent from the Tandem Node to Node 2, the Satellite information is lost.

Figure 127
SAT-count is not updated when NSIG is not configured on the bearer (VSIG = YES and SIGO is set to STD)



Referring to Figure 128, in a case where the bearer passes a Tandem Node (Node 2) with NSIG on the route, the call is blocked at Node 2 when the NCOS is insufficient.

Figure 128
A scenario where the call is blocked, as NCOS is insufficient (VSIG = YES and SIGO is not set to STD)



Feature interactions

NSIG on VNS has no specific interactions with existing features.

Feature packaging

The NSIG on VNS feature requires the following packages:

- Basic Routing (BRTE) package 14
- Network Class of Service (NCOS) package 32
- Network Alternate Route Selection (NARS) package 58
- ISDN Signaling (ISDN) package 145
- ISDN Signaling Link (ISL) package 147
- Advanced Network Services (NTWK) package 148
- Virtual Network Services (VNS) package 183

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 17 – Allow or deny Network Signaling on Virtual Network Services.

LD 17 – Allow or deny Network Signaling on Virtual Network Services.

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	CFN	Configuration data block
- ADAN	CHG DCH 0-63	Change D-Channel information.
- USR		Type of user.
	VNS SHAV	Virtual Network Services. D-Channel used for VNS or ISLD. Shared Virtual Network Services. D-Channel shared between PRI, VNS, and ISLD.
- - VCRD	YES	Virtual Network Services Network Call Redirection is available over this D-Channel.

- - VTRO	(NO) YES	Trunk Route Optimization before answer is available over this D-Channel for VNS.
- - VSIG	(NO) YES	NSIG on VNS (denied) allowed. When VSIG = YES, the Signaling arrangement is ESN5. When VSIG = NO, the Signaling arrangement is Standard.

Feature operation

No specific operating procedures are required to use this feature.

Network Tenant Service

Contents

The following are the topics in this section:

Feature description 1399
Attendant routing 1400
Tenant-to-tenant blocking 1400
Timed Reminder Recalls 1400
Operating parameters 1401
Feature interactions 1401
Feature packaging 1401
Feature implementation 1402
Task summary list 1402
Feature operation 1405

Feature description

This feature provides the capability of Network Attendant Service (NAS) on a tenant basis, with network-wide tenant-to-tenant and tenant-to-trunk blocking.

The Multi-location Business Group (MBG) number is the grouping agent used to associate users belonging to a customer group or “sub-group”. Network Tenant Service (NTS) uses MBG numbers to define the relationship between the Multi-location Business Group Subgroup (MBGS) number and the tenant number on a particular node. The tenant number related to an outgoing call is translated into the corresponding MBGS number and then transmitted through the network. At the terminating node, the MBGS number is translated back into a meaningful tenant number.

Attendant routing

NTS allows Console Presentation Groups (CPGs) and related attendants to be defined at any node in the Integrated Services Digital Network (ISDN).

Calls can be directed to another node based upon:

- a time of day schedule defined at the CPG level
- overflow conditions
- status of local attendants in the CPG group
- status of trunks to other attendant locations
- status of the NAS key on a customer basis, and
- Night Service indicator of the CPG group.

Each Attendant Console group (ACG) can have its own NAS routing table defined. Calls not associated with a particular console group will be presented to ACG 0.

Tenant-to-tenant blocking

It is possible to define tables which allow or deny calls between tenant groups in the same customer group. Normal intercept treatment is given to a station attempting to dial into a denied access tenant.

Tenant to tenant blocking is maintained across the network. Access is allowed or denied according to information defined on the node which currently processes the call.

It is possible with network-wide tenant-to-tenant blocking to define one-way restrictions (“A” cannot call “B”, but “B” can call “A”), even though this is not possible in standalone cases. If nodes do not have the same tenant-to-tenant restrictions defined, one-way blocking can result.

Timed Reminder Recalls

Timed Reminder Recalls work in the same way as in NAS, but on a tenant basis. The attendant is chosen based on the tenant number of the target party.

Operating parameters

To ensure correct call routing, all nodes in the ISDN must have the Network Tenant Service feature equipped.

Each ACG can have a NAS routing table, or several ACGs may share the same NAS routing table. However, the NAS key is defined only on a customer basis – it is not a CPG-level parameter. When one Attendant Console activates the NAS key, regardless of ACG, the entire system is in NAS service.

Feature interactions

Intercept Computer Dial from Directory

The Intercept Computer (ICP) Dial from Directory feature only works at the customer level and for a single node. If several tenants are configured in a network situation, they will all be affected by how the ICTD prompt in LD 15 has been configured for the customers on different nodes

Feature packaging

The following packages are required for this feature to operate properly:

- Basic Routing (BRTE) package 14;
- Network Class of Service (NCOS) package 32;
- Network Alternate Route Selection (NARS) package 58;
- Multi-tenant Service (TENS) package 86;
- Integrated Services Digital Network (ISDN) package 145;
- ISDN Primary Rate Interface (PRI) package 146; or
- 2.0 Mb Primary Rate Access (PRA) package 154.
- Network Attendant Service (NAS) package 159;

  Note: Attendant Overflow (AOP) package 56 must not be equipped.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 15 – Define the Multi-Location Business Group value in the Customer Data Block. This value is sent as the Business Group Identifier in the MBG Information Element.

2 LD 17 – Define a prompt to control whether the MBG parameter is sent on a particular D-channel.

3 LD 86 – Define a table number for the NAS routing table. If no table number is entered, table 0 applies the customer.

4 LD 93 – Define the relation between a Multi-Location Business Group Subgroup and a tenant number. Assign a NAS routing table with a particular Attendant Console Group.

5 LD 93 – Define the relation between a Multi-Location Business Group Subgroup and a tenant number. Assign a NAS routing table with a particular Attendant Console Group.

LD 15 – Define the Multi-Location Business Group value in the Customer Data Block. This value is sent as the Business Group Identifier in the MBG Information Element.

Prompt	Response	Description
REQ:	NEW CHG	Add new data. Change existing data.
TYPE:	NET	Networking data.
CUST	xxx	Customer number.
...		
- ISDN	(NO) YES	Integrated Services Digital Network (not) allowed for this customer.
- PNI	(0)-32700	Private Network Identifier. Prompted if ISDN = YES.

- MBG	(0)-65535	Multi-Location Business Group. This parameter is used to define the Multi-Location Business Group. 0 = no indication. 1 = reserved for public network. 2-65535 = Business Group Identifiers.
- BSGC	(0)-65535	Business Sub Group Consult-only. 0 = no indication. 1-65535 = Subgroup identifier. This value is sent as the Multi-Location Business Group Subgroup (MBGS) identifier or tenant number when an existing call has more than two different MBGSs. In this case, a consultation connection will be allowed, but completion of a call modification, such as conference or transfer, will be disallowed.

LD 17 – Define a prompt to control whether the MBG parameter is sent on a particular D-channel.

If MBGA is set to YES, the MBG will be sent on the D-channel as required. If MBGA is set to NO, the MBG will not be sent on the D-channel. Note that the RLS value in the D-channel data block also prevents the sending of the MBG parameter to versions of the software that do not support MBG.

Prompt	**Response**	**Description**
REQ	CHG	Change.
TYPE	CFN ADAN	Configuration Record. Gate opener.
ISDN	(NO) YES	Integrated Services Digital Network.
...		
- NASA	(NO) YES	Network Attendant Service (disallowed) allowed.
- MBGA	(NO) YES	Multi-Location Business Group messages are allowed to be sent on this D-channel.

LD 86 – Define a table number for the NAS routing table. If no table number is entered, table 0 applies the customer.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
CUST	xx	Customer number.
FEAT	NAS	Network Attendant Service.
TBL	(0)-63	NAS routing table 0. 0 is the customer routing table. It is associated with ACG 0. Prompted if FEAT = NAS.
ALT	1-7 X1-X7	Alternative number to be defined. Precede with “X” to delete the alternative number.

LD 93 – Define the relation between a Multi-Location Business Group Subgroup and a tenant number. Assign a NAS routing table with a particular Attendant Console Group.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	TACC	Tenant Access information.
CUST	xx	Customer number.
TEN	1-511	Tenant number.
MBGS	(0)-65535	Multi-Location Business Group Subgroup number associated with this tenant. 0 means no indication.

LD 93 – Define the relation between a Multi-Location Business Group Subgroup and a tenant number. Assign a NAS routing table with a particular Attendant Console Group.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.

TYPE	ACG	Attendant Console Group.
CUST	xx	Customer number.
AGNO	1-63	ACG number.
NTBL	(0)-63	NAS routing table to be used for calls directed to this ACG.

Feature operation

No specific operating procedures are required to use this feature.

Network Time Synchronization

Contents

The following are the topics in this section:

Description 1407
Operating parameters 1409
Feature interactions 1409
Feature packaging 1409
Feature implementation 1410
Task summary list 1410
Feature operation 1415

Description

The Network Time Synchronization feature is designed to ensure that all time stamps in a network are synchronized from one source. One switch becomes the master for this purpose.

In a private network environment, each switch in the network has an individual system clock. These system clocks can, under certain conditions, lose or gain time, causing inaccurate time stamps for different features.

Also, in a private network, several switches can be located in different time zones. As features become more centralized in a network environment, it is useful to have time stamps based on one time zone.

To provide Time Synchronization on a network-wide basis, Meridian Customer Defined Integrated Services Digital Network (ISDN) nodes can request Time Synchronization from another node, using D-channel messages. Therefore, Slave switches can request the time from the Master switch, while the Master switch can do the same to a Backup node.

A time difference (or delta) is provided for every node, in order to distinguish time zones for time usage by local features (e.g., Automatic Wake-up) and centralized ones (e.g., Centralized Call Detail Recording).

The Time Synchronization request messages are composed of:

- the message identifier
- the requester's ID
- the time
- the date
- the time-adjust factor

IDs are virtual DNs, and are used to route the messages.

On the Slaves, Time Synchronization requests are sent automatically under the background routines (default setup) or with the daily routines (optional setup), every time a time change is performed (to accurately set the seconds), and on every SYSLOAD and initialization.

On the Master, Time Synchronization requests are sent to a Backup node upon initialization and, therefore, after SYSLOAD. The Master will be forbidden to synchronize Slave switches during these backup periods. In the rare event where Master and Backup nodes would start requesting synchronization at the same time, the real time will be considered to be on the Slave node, if it is not initializing. If both nodes are only initializing, the real time would be considered to be carried by the Master switch. If a SYSLOAD occurs at the Master and the Slave is initializing, the real time would be considered to be carried by the Slave switch. A warning message will be printed if both switches SYSLOAD, and all Time Synchronization would be put to a halt until the Master’s clock is reset.

If no answer is received on the first time synchronization request (by the end of the request time-out), extra Time Synchronization requests will be sent. If there is still no answer on the third time synchronization request, a warning message will be issued.

Note 1: Upon SYSLOAD, the clock starts on time zero, while upon initialization, only the seconds are lost.

Note 2: Through service change (LD 2) or through an Attendant Console, the clock can be reset to the correct time if desired. If the Network Time Synchronization feature is on, then the Master will be requested for synchronization upon these service changes (to permit fine synchronization).

Operating parameters

This feature uses D-channel messaging over a Meridian Customer Defined Integrated Services Digital Network (ISDN).

Feature interactions

Time-of-day Adjustment

Every time LD 2 is used to change the system time, a request for synchronization will be made of the Master to accurately set the seconds.

Time and Date (TAD) Attendant key

As done with LD 2, every time the TAD key is used to change the system time, a request for synchronization will be made to the Master to accurately set the seconds.

Call Detail Recording (CDR)

Upon receipt of synchronization messages, Slave switches will issue CDR records (if so equipped) for monitoring the feature. These CDR records will be identical to those issued by a time change performed in LD 2 or by an attendant's TAD key.

Feature packaging

This feature is included with the Integrated Services Digital Network Supplementary Features (ISDNS) package 161.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 2 – Define entries for the Network Time Synchronization feature.

2 LD 22 – Print the DN type for the Network Time Synchronization Virtual DN. The DN type is “TIME”.

LD 2 – Define entries for the Network Time Synchronization feature.

These include setting and typing the time of day with the “STAD” and “TTAD” commands, and setting and typing the time-of-day adjustments with the “SDTA” and “TDTA” commands.

If the Integrated Services Digital Network Supplementary Features (ISDNS) package (161) is equipped, commands to enter, modify and print the Network Time Synchronization parameters will be allowed. The parameters are:

- the node status
- the number of the customer in charge of synchronizing the switch
- the local and Master or backup virtual DNs (with their associated access code[s])
- the time difference between the two nodes, and
- the requesting mode used (as part of the background or daily services [midnight] routines).

The following steps are used to configure Network Time Synchronization:

1 **Node Status:** Can either be Master, Slave, or standard stand-alone node (MAST, SLAV or STDA).

2 **Customer Number:** Customer that will issue and receive the Network Time Synchronization messages. The default value is “0”. For a change (only possible on switches with the multi-customer package) to be accepted, the customer should already exist. Furthermore, the Local DN has to be reentered.

3 **Local DN:** Virtual DN (access code included) dedicated for synchronization services on the Local node; up to 16 digits. A call with these routing digits should terminate on the previously designated customer.

4 **Master or Backup DN:** Virtual DN (access code included) dedicated for synchronization services on the Master or Backup node; up to 16 digits.

5 **Time Delta:** Time difference added to the local time in order to get the Master or Backup time. The entry is prefixed with the digit 1 for positive and 0 for negative.

6 **Requesting mode:** Operating mode used to request the time synchronization messages (i.e., with the background routines (default setup) or with the daily services (BKGD or DSVC)).

Note: The first four steps must be completed for the Network Time Synchronization feature to be operational.

The following commands are Network Time Synchronization feature specific:

Query Node Status (Type Time Synchronization Status).

The command format is:

INPUTOUTPUT

.TTSS.TTSS (STATUS)

Example:

.TTSS.TTSS MAST

Set Node Status (Set Time Synchronization Status).

The command format is:

.STSS (status)
where status may be:
STDA — stand-alone (default)
MAST — Master
SLAV — Slave

Example:

.STSS SLAV

Query Customer in charge (Type Time Synchronization Customer).

The command format is:

INPUTOUTPUT

.TTSC.TTSC (CUSTOMER NUMBER)

Example:

.TTSC.TTSC 5

Set Customer in charge (Set Time Synchronization Customer).

The command format is:

.STSC (customer number)
where customer may be:
0 - 99 — 0 is default.

Example:

.STSC 5

Query Local Virtual DN (Type Local DN).

The command format is:

INPUTOUTPUT

.TLDN.TLDN (DN)

Example (for 6 = ESN access code, 613 = ESN location code, 5999 = DN):

.TLDN.TLDN 66135999

Set Local Virtual DN (Set Local DN).

The command format is:

.SLDN (dn)

Example:

.SLDN 66135999

Query Master or Backup Time Synchronization Number (Type Master DN).

The command format is:

INPUTOUTPUT

.TMDN.TMDN (DN)

Example (for 6 = Outside line, 514 = ESN code, 3999 = DN):

.TMDN.TMDN 65143999

Set Master or Backup Time Synchronization Number (Set Master DN).

The command format is:

.SMDN (dn)

Example:

.SMDN 65143999

Query Time Delta.

The command format is:

INPUT *OUTPUT*

.TDEL.TDEL (SIGN) (HR) (MIN)

Example:

.TDEL.TDEL 0 01 30

Set Time Delta.

The command format is:

.SDEL (sign) (hr) (min)
where:
sign – is the time-adjust factor direction indicator which may be:
0 — to indicate the Master switch is behind in time.
or
1 — to indicate the Master switch is ahead in time.
hr – is the number of hours the time must be adjusted by and may be any number from 0 to 23, and
min – is the number of minutes the time must be adjusted by and may be any number from 0 to 59.

0 is the default for the SDEL parameters.

Example:

.SDEL 1 23 00

Note: The hour and minute entries are two digits. The minute entry is defaulted to zero if not entered. “1” identifies a positive delta (Master is ahead in time), “0” identifies a negative delta.

Query Requesting Mode (Type MODe).

The command format is:

INPUT *OUTPUT*

.TMOD.TMOD (MODE)

Example:

.TMOD.TMOD BKGD

Set Requesting Mode (Set MODe).

The command format is:

.SMOD (mode)
where mode may be:
BKGD — Background (default)
or
DSVC — Daily Service (midnight)

Example:

.SMOD DSVC

LD 22 – Print the DN type for the Network Time Synchronization Virtual DN. The DN type is "TIME".

Feature operation

Each node of the network that is to be synchronized sets its status (i.e., Master, Slave, or Standard stand-alone (the feature is not used)). The craftsperson also sets the node's customer in charge of synchronizing the switch (that customer will request Time Synchronization and receive the time from the Master or Backup switch). The customer must already exist, prior to referencing it, and then sets the local access code(s) with the virtual DN, the Master (or Backup) routing digits, the time difference between local and Master nodes, and the requesting mode (i.e., performed under the background routines (default) or the daily services. The time delta and the requesting mode are optional entries).

The time synchronization feature is designed to work in a Meridian Customer Defined Integrated Services Digital Network (ISDN) environment, using D-channel messages. The synchronization messages are carried by TCAP facility messages on a Meridian Customer Defined ISDN, and routed according to the configuration defined in LD 2.

Once the configuration is defined in LD 2, the Slaves will automatically start requesting “time-stamps” from the Master periodically, upon initialize, and when the time and date is changed in LD 2. The message to be sent is identified as being a time synchronization request. The stored Master's routing digits (access code(s) + virtual DN) are used to route the synchronization request(s). As part of the request, the requester's access code(s) + virtual DN is sent to provide the Master with a way back to the requesting node.

Upon receipt at the Master node, the terminating DN is recognized as being a time synchronization virtual DN, and the request is then processed. The processing consists of constructing a message, identified as being a time synchronization response and originating from that virtual DN, which includes:

- time
- date, and
- time-adjust factor (if used).

The message is then routed to the Slave using the access code(s) and virtual DN provided with the request. The time-adjust factor is sent to all Slaves in order to have the whole network correct any inaccurate clock settings in unison, if any slippage correction is necessary.

Up to three requests will be sent at one minute intervals, to allow the system to overcome possible temporary malfunctions. On receipt of the time message, the requester verifies the originator's ID (its virtual DN), and updates its clock accordingly (i.e., equal to the time sent minus the time delta between the two switches). If equipped with the CDR package, a time change record is provided with every time synchronization occurrence.

Network-wide Listed Directory Number

Contents

The following are the topics in this section:

Description 1417
Operating parameters 1418
Feature interactions 1418
Feature packaging 1419
Feature implementation 1420
Task summary list 1420
Feature operation 1421

Description

Listed Directory Numbers (LDNs) can be defined as Incoming Call Identification (ICI) keys on an Attendant Console, making it possible to have different presentations when different DNs are dialed. Without this feature, it was only possible to define four LDNs on a Meridian 1. This feature makes it possible to define six LDNs on a Meridian 1.

Without this feature, when an LDN call was routed from one node to another, the call was presented according to trunk type (for example, NDID, NTIE, NCO, NFEX, or NWAT). The call was presented on LDN key zero if none of the trunk route ICIs were configured. With the Network-wide Listed Directory Number feature, if the dialed DN is an LDN and an LDN key exists that corresponds to the dialed LDN, the call is presented on that ICI LDN key.

This feature also enables LDNs to be recognized network -wide when Network Attendant Service (NAS) is used. The same LDNs must be configured in multiple nodes. Network LDN is defined on a customer basis.

Operating parameters

The network part of this feature works in a Meridian Customer Defined Network (MCDN) environment with NAS configured.

The LDNs to be used network -wide cannot be used in conjunction with Distant Steering Codes.

Feature interactions

Call Forward No Answer

With this feature, the LDN ICI has a higher priority than CFNA ICI. When a call is forwarded to an LDN via Flexible DN, the call will be presented on the LDN ICI.

Departmental Listed Directory Number

Departmental LDN is not supported over the network; however, this feature does provide two more LDNs for the DLDN feature.

Console Presentation Group

This feature provides two more LDNs per Console Presentation Group.

Console Operation/Console Presentation

Console Operation makes it possible for each console to select which ICI call types will be presented to the console. Network -wide LDN does not work with the Console Presentation feature because it is not supported by NAS. Console Operation can, however, be configured with two new LDNs.

Network Message Center

With this feature, the LDN ICI has a higher priority than MWC ICI. When a call is forwarded to an LDN over the network to a Message Center, the call will be presented on the LDN ICI.

Network Attendant Service

The way the network LDN calls are presented in a NAS environment is changed by this feature. The presentation on the NDID, NTIE, NCO, NFEX, or NWAT, and the LDN0 key is changed to the correct LDN key, if it exists. Otherwise, it will be presented as it previously was on the NDID or LDN0 key.

Console Operation/Queue Thermometer

The queue thermometer indicates how many calls are in the queue for a certain ICI key. An ICI key can correspond to more than one ICI type. Even though the ICI type of a call may be different with or without this feature active, it will not interact with queue thermometer operations.

Centralized Attendant Service

Centralized Attendant Service (CAS) is mutually exclusive to the NAS package. As the network wide LDN feature requires NAS for its networking functions, the network part of this feature will not work with CAS, but the two extra LDNs can be used locally.

Feature packaging

Network Wide LDN requires Network Attendant Service routing. The following packages are required for Network-wide LDN:

- Basic Routing (BRTE) package 14;
- Network Class of Service (NCOS) package 32;
- Network Alternate Route Selection (NARS) package 58;
- Network Attendant Service (NAS) package 159; and
- applicable ISDN options, depending upon customer requirements.

To use the attendant queue thermometer, Console Operations (COOP) package 169 must be provisioned.

For Departmental LDN to be configured with six LDNS, Departmental LDN (DLDN) package 76 must be provisioned.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 10, 11 – The LDN prompt has been changed to accept a greater value (0-5) in these overlays.

2 LD 15 – Define the extended LDN numbers and the Listed Attendants (LDAs) belonging to the LDNs. The prompts can be answered in the same way as the prompts LDN0, 1, 2, 3. The LDA prompts only appear if DLDN is set to YES. These store the Attendant Console number associated with the LDN number.

3 LD 15 – Turn on or off the network recognition of the LDNs. The ICI keys can also be assigned to the new LDN values.

LD 10, 11 – The LDN prompt has been changed to accept a greater value (0-5) in these overlays.

LD 15 – Define the extended LDN numbers and the Listed Attendants (LDAs) belonging to the LDNs. The prompts can be answered in the same way as the prompts LDN0, 1, 2, 3. The LDA prompts only appear if DLDN is set to YES. These store the Attendant Console number associated with the LDN number.

Prompt	Response	Description
REQ:	NEW CHG	Add new data. Change existing data.
TYPE:	LDN	Departmental Listed Directory Numbers data.
CUST	xx	Customer number.
- OPT	aaa	Options.
- DLDN	YES	Departmental Listed Directory Numbers.
...		
- LDN3	...	Listed DN 3.
- LDA4	xx xx... ALL	xx can be in the range of 1-63 or all attendants. Precede an attendant number with X to remove.

- LDN4	x...x	Listed Directory Number. If the DNXP package is equipped, up to seven digits are allowed; otherwise, only four digits are allowed.
- LDA5	xx xx... ALL	xx can be in the range of 1-63 or all attendants. Precede an attendant number with X to remove.
- LDN5	x...x	Listed Directory Number. If the DNXP package is equipped, up to seven digits are allowed; otherwise, only four digits are allowed.

LD 15 – Turn on or off the network recognition of the LDNs. The ICI keys can also be assigned to the new LDN values.

Prompt	Response	Description
REQ:	NEW CHG	Add new data. Change existing data.
TYPE:	LDN	Departmental Listed Directory Number data.
CUST	xx	Customer number.
- OPT	NLDN	Network-wide LDN allowed
...		
- ICI	xx LD4	New answer to existing prompt, where xx is the key number.
- ICI	xx LD5	New answer to existing prompt, where xx is the key number.

Feature operation

There are no operating procedures specified for this feature.

Network Break-in and Force Disconnect

Contents

The following are the topics in this section:

Feature description 1423
Network Break-in 1424
Network Force Disconnect 1424
Network Break-in and Force Disconnect post-dial example 1425
Priority Levels 1426
Operating parameters 1426
Feature interactions 1427
Feature packaging 1430
Feature implementation 1430
Task summary list 1430
Feature operation 1433
Network Break-in operation 1434
Network Force Disconnect operation 1437

Feature description

The Network Break-in and Force Disconnect feature allows an analog (500/2500 type) or a Meridian Digital telephone to perform the following functions:

- break in to an established two-party call
- force disconnect an established two-party call

Network Break-in

With Network Break-in, a telephone can break-in to an established two-party call. When the telephone initiates a break-in operation, it is placed in conference with the other two parties. A warning tone can be provided to all parties. The warning tone option must be allowed in Overlay 15 for the wanted party's customer group.

The user of the overriding telephone can initiate the break-in operation using one of the following:

- Priority Override Network Wide (PONW) key for Meridian Digital telephones. The PONW lamp on the overriding telephone provides the status of the break-in operation.
- Priority Override Network Wide (PONW) Flexible Feature Code (FFC) for analog (500/2500 type) telephones

Network break-in applies to both pre- and post-dial operations. For a pre-dial operation, the user of the overriding telephone presses the PONW key or dials the PONW FFC prior to dialing the wanted party's DN.

For a post-dial operation, the user of the overriding telephone dials the wanted party's DN. When they receive a busy tone, they then press the PONW key or dial the PONW FFC.

Network Force Disconnect

Network Force Disconnect allows a telephone to disconnect an established two-party call. A call is then established between the overriding telephone and the wanted telephone. A single warning tone can be provided to all parties before the disconnect operation takes place. The warning tone option must be allowed in Overlay 15 for the wanted party's customer group.

The user of the overriding telephone can initiate the force disconnect operation using one of the following:

- Forced Disconnect (FDIS) key for Meridian Digital telephones
  The FDIS lamp on the overriding telephone provides the status of the force disconnect operation
- Forced Disconnect Flexible Feature Code (FFC) for analog (500/2500 type) telephones

Network Force Disconnect applies to both pre- and post-dial operations. For a pre-dial operation, the user of the overriding telephone presses the FDIS key or dials the PONW FFC prior to dialing the wanted party's DN.

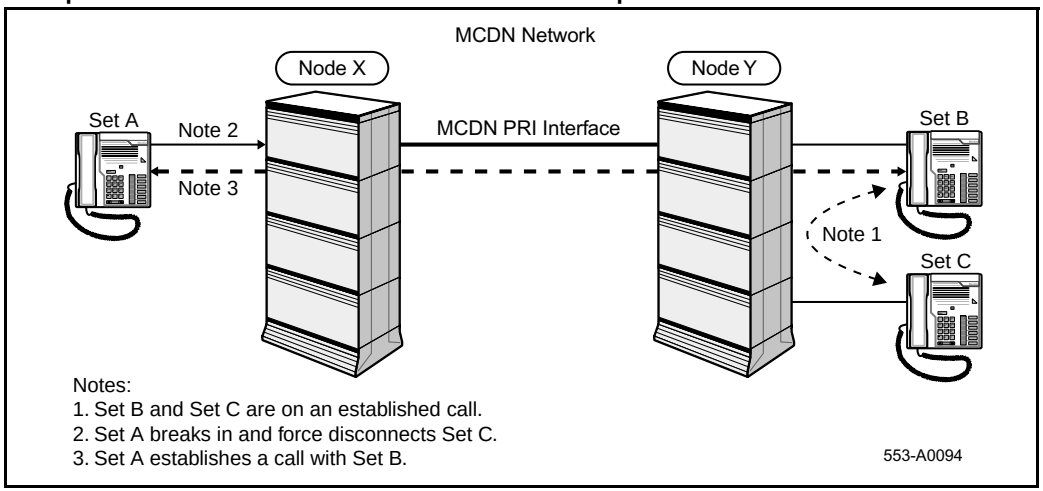
For a post-dial operation, the user of the overriding telephone dials the wanted party's DN. When they receive busy tone, they then press the FDIS key or dial the FDIS FFC.

Network Break-in and Force Disconnect post-dial example

As illustrated in Figure 129, Node X and Node Y are two Meridian 1 systems connected by a Meridian Customer Defined Network (MCDN) Primary Rate Interface (PRI). Set A, a Meridian Digital telephone on Node X, is the overriding party. Sets B and C are in an established two-party call on Node Y. Set B is the wanted party and Set C is the unwanted party.

Set A dials Set B and receives a busy tone. Set A presses the PONW key. Set A enters into a conference with Sets B and C. A warning tone is provided to all three parties. Set A presses the FDIS key. Set C is disconnected. Sets A and B are placed in a simple, two-party call.

Figure 129
Example of a network break-in and force disconnect operation



Priority Levels

Priority Levels (PLEVs) are configured on an individual telephone basis. A telephone can break-in to or disconnect an established call only if it has a Priority Level greater than or equal to the Priority Levels of the wanted and unwanted parties. If the unwanted party is an external trunk call, the PLEV of the route applies.

Table 93 lists the various PLEVs that can be assigned to a telephone or route.

Table 93
Priority Levels

Priority Levels	Overriding Party	Wanted/Unwanted Parties
0	Cannot override	Cannot be overridden
1	Cannot override	Cannot be overridden
2	Can override level 2	Can be overridden by levels 2-7
3	Can override levels 2 and 3	Can be overridden by levels 3-7
4	Can override levels 2-4	Can be overridden by levels 4-7
5	Can override levels 2-5	Can be overridden by levels 5-7
6	Can override levels 2-6	Can be overridden by levels 6 and 7
7	Can override levels 2-6 Assign level 7 to ACD supervisors only	Cannot be overridden

Operating parameters

This feature applies to analog (500/2500 type) and Meridian Digital telephones.

The Network Break-in and Force Disconnect feature is supported when the overriding and wanted parties are:

- on the same node
- on different nodes and connected by an MCDN interface

The unwanted party can be any of the following. Refer to Figure 129:

- an analog (500/2500 type) telephone or Meridian Digital telephone located on the same node as the wanted party (Node Y)
- an analog (500/2500 type) telephone or Meridian Digital telephone located on a different node (Node X) and connected by an MCDN interface to the wanted party's node (Node Y)
- an external user in conversation with the wanted party over Direct Inward Dialing (DID), TIE, or Central Office trunks (COT). The external interface to Node Y can be analog trunks or ISDN CO connectivity.

If the force disconnect request is rejected, an overflow tone is provided. For digital telephones, the PONW/FDIS lamp winks and overflow tone is provided.

If the wanted party's telephone is idle when the pre-dial operation begins, the pre-dial operation is cancelled and the wanted party's telephone rings.

Feature interactions

Attendant Call

In a stand-alone environment, a telephone cannot break-in to an attendant call. In a networking environment, however, Network Attendant Service (NAS) must be enabled to avoid a telephone breaking in to an attendant call.

Automatic Call Distribution

Any telephone with a PLEV of 7 (except for a 500 ACD agent telephone) can be used to break-in to an ACD call. Knowing the Agent's position ID is required.

No telephone can be used to break-in to a supervisor's call.

An ACD telephone goes in Not Ready (NRD) state when it invokes the Network Break-in and Forced Disconnect feature by pressing the Priority Network Override (PONW) or Force Disconnect (FDIS) key.

The ACD telephone is removed from the idle agent's queue and is then no longer serving the queue. After the call is released, the telephone remains in the NRD state. You have to manually remove the telephone from the NRD state by pressing the NRD key again. If the telephone does not have an NRD key, you have to press the ACD key to log into the telephone.

A conference is set up if:

- Supervisor Disconnects: Agent and the Customer are in a call.
- Agent Disconnects: Supervisor and Customer are in a call.
- Customer Disconnects: Supervisor and Agent are in a call.

A post-dial operation for the Network Break-in and Forced Disconnect on an ACD agent is not allowed.

An FDIS operation on an ACD agent is not allowed.

A speech path is always established as a two-way speech path.

Call Detail Recording

The Network Break-in and Force Disconnect feature does not affect Call Detail Recording (CDR) records. On the CDR records, Network Break-in is treated as a normal conference and Force Disconnect is treated as normal call clearing.

Call Forward
Call Waiting
Camp on
Hunt

Post-dial operations do not override the Call Forward, Call Waiting, Camp on, or Hunt features configured on the wanted party’s telephone.

Pre-dial operations override the Call Forward, Call Waiting, Camp on, and Hunt features configured on the wanted party’s telephone.

If Call Forward or Hunt is performed on a local telephone or to a telephone on a different MCDN node, then post-dial/force disconnect occurs on the redirected telephone (if the break-in conditions are met).

If there is a call waiting or camped on the wanted party's telephone, the pre-dial operation can still break-in or force disconnect.

Call Park

Network break-in or force disconnect operations cannot be performed on a parked call.

Conference

Network break-in or force disconnect operations cannot be performed on a telephone that is in conference. However, if the originator of a conference is on a different node, it can break-in and force disconnect the unwanted party from the conference. A call is then established between the overriding party and the wanted party.

Do Not Disturb

Network break-in or force disconnect operations cannot be performed if Do Not Disturb (DND) is configured on the telephone.

Make Set Busy

Network break-in or force disconnect operations cannot be performed if Make Set Busy (MSB) is configured on the telephone.

Meridian Mail

Network break-in or force disconnect operations do not occur when the wanted party is using Meridian Mail or Call Pilot.

Orbit Prevention

When Orbit Prevention is enabled, if a call is forwarded to a telephone on a different MCDN node, it removes the Call Forward operation for the trunk-to-trunk call for a specified period of time. During this period of time, the post-dial operation cannot be performed.

The Flexible Orbiting Prevention Timer (FOPT) is set to 14 seconds by default. Most calls will be released within this time if the post-dial operation is performed after the timer expires. As a result, the FOPT should be set to a lower value.

Priority Override

The Priority Override feature is independent of the Network Override and Force Disconnect feature.

Ring Again

When the wanted party's telephone is busy, the overriding telephone can either trigger ring again or post-dial break-in/force disconnect.

Virtual Network Services

Virtual Network Services (VNS) supports the Network Break-in and Force Disconnect feature.

Feature packaging

The Network Break-in and Force Disconnect feature introduces Priority Network Override (PONW) package 389.

Network Break-in and Force Disconnect also requires the following existing packages:

- ISDN Signaling (ISDN) package 145
- Primary Rate Access (PRA) package 146
- Primary Rate Interface2 (PRI2) package 150
- Multi-Serial Data Link (MSDL) package 222

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 17 - Configure the Release ID for the D-channels.

2 LD 15 - Allow or deny the Break-in Warning Tone.

3 LD 16 - Configure the Priority Level (PLEV) for the route.

4 LD 10 - Configure break-in warning tone options and PLEV values for analog (500/2500 type) telephones.

5 LD 11 - Configure break-in and force disconnect Classes of Service, function keys, warning tone options, and PLEV values.

6 LD 57 - Configure the Flexible Feature Codes (FFCs).

LD 17 – Configure the Release ID for the D-channels.

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	ADAN	Action Device and Number.
ADAN	CHG DCH xx	Change D-channels.
RLS	xx	Software Release ID of the switch at the far-end of the D-channel, where xx is 25 or higher.

LD 15 – Allow or deny the Break-in Warning Tone.

Prompt	Response	Description
REQ:	CHG	Change existing data.
TYPE:	FTR	Feature data.
CUST	xx	Customer number.
...		
OPT	(BWTD) BWTA	Break-in Warning Tone Denied (default). Break-in Warning Tone Allowed.

LD 16 – Configure the Priority Level for the route.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	RDB	Route Data Block.

ROUTE	xxx	Route Number.
PLEV	0-(2)-7	Priority Level.

LD 10 – Configure break-in warning tone options and PLEV values for analog (500/2500 type) telephones.

Prompt	Response	Description
REQ:	NEW CHG	Add new data. Change existing data.
TYPE:	500	Telephone type.
CLS	(NOVD) NOVA	Network Override/Break-in Denied (default). Network Override/Break-in Allowed.
CLS	(FDSD) FDSA	Force Disconnect Denied (default) Force Disconnect Allowed
PLEV	0-(2)-7	Priority Levels.

LD 11 – Configure break-in and force disconnect Classes of Service, function keys, warning tone options, and PLEV values.

Prompt	Response	Description
REQ:	NEW CHG	Add new data. Change existing data.
TYPE:	2616	Telephone type.
CLS	(NOVD) NOVA	Network Override/Breakin Denied (default). Network Override/Breakin Allowed.
CLS	(FDSD) FDSA	Force Disconnect Denied (default) Force Disconnect Allowed
KEY	PONW	Priority Override/Breakin Networkwide Key.
KEY	FDIS	Force Disconnect Key.
PLEV	0-(2)-7	Priority Levels.

LD 57 – Configure the Flexible Feature Codes (FFCs).

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE:	FFC	Flexible Feature Code.
CUST	xx	Customer number.
...		
CODE	PONW	FFC Type.
PONW	xxxx	Activate PONW.
CODE	FDIS	FFC Type.
FDIS	xxxx	Activate FDIS.

Feature operation

This section describes the procedures for performing the network break-in and force disconnect operations on both Meridian Digital and analog (500/2500 type) telephones. The feature operation is described using Sets A, B, and C from Figure 129 on page 1425.

Network Break-in operation

Post-dial operation for Meridian Digital telephoness

Table 94 shows the post-dial network break-in operation for a Meridian Digital telephone.

Table 94
Post-dial network break-in operation for a Meridian Digital telephone

Actions	Response	Set A PONW lamp status
Sets B and C are involved in a two-party call.	—	—
Set A dials Set B.	Set A receives a busy tone.	—
Set A presses the PONW key.	Set A enters into a Conference with Sets B and C. If configured, a warning tone is provided to all three parties.	PONW key lamp is lit.
If Set C disconnects...	Sets A and B are placed in a simple, two-party call. The warning tone is removed.	PONW key lamp goes dark.
If Set B disconnects...	Set C is disconnected. The warning tone is removed. Set B rings.	Meridian PONW key lamp goes dark.

Pre-dial operation for Meridian Digital telephones

Table 95 shows the pre-dial network break-in operation for a Meridian Digital telephone.

Table 95
Pre-dial network break-in operation for a Meridian Digital telephone

Actions	Response	Set A PONW lamp status
Sets B and C are involved in a two-party call.	—	—
Set A presses the DN key and then presses the PONW key.	Set A receives dial tone.	The PONW key lamp flashes. This indicates the pre-dial mode.
Set A dials the DN of Set B	Set A enters into a conference with Sets B and C. If configured, a warning tone is provided to all three parties.	The PONW key lamp is lit.
If Set C disconnects...	The warning tone is removed. Sets A and B are placed in a simple, two-party call.	The PONW key lamp goes dark.
If Set B disconnects...	Set C is disconnected. The warning tone is removed. Set B rings.	The PONW lamp goes dark.

Post-dial operation for analog (500/2500 type) telephones

Table 96 shows the post-dial network break-in operation for analog (500/2500 type) telephones.

Table 96
Post-dial network break-in operation for an analog (500/2500 type) telephone (Part 1 of 2)

Actions	Response
Sets B and C are involved in a two-party call.	—
Set A dials Set B.	Set A receives a busy tone.

Table 96
Post-dial network break-in operation for an analog (500/2500 type) telephone (Part 2 of 2)

Actions	Response
Set A presses the Flash key and dials the PONW FFC code.	Set A enters into a Conference with Sets B and C. If configured, a warning tone is provided to all three parties.
If Set C disconnects	Sets A and B are placed in a simple, two-party call. The warning tone is removed.
If Set B disconnects	Set C is disconnected. The warning tone is removed. Set B rings.

Pre-dial operation for analog (500/2500 type) telephones

Table 97 shows the post-dial network break-in operation for analog (500/2500 type) telephones.

Table 97
Pre-dial network break-in operation for an analog (500/2500 type) telephone

Actions	Response
Sets B and C are involved in a two-party call.	—
Set A dials the PONW FFC and then Set B's DN.	Set A receives dial tone and then enters a conference with Sets A and B. If configured, a warning tone is provided to all three parties.
If Set C disconnects	The warning tone is removed. Sets A and B are placed in a simple, two-party call.
If Set B disconnects	Set C is disconnected. The warning tone is removed. Set B rings.

Network Force Disconnect operation

Post-dial network force disconnect operation for Meridian Digital telephones

Table 98 shows the post-dial network force disconnect operation for a Meridian Digital telephone.

Table 98
Post-dial network force disconnect operation for a Meridian Digital telephone

Actions	Response	Set A PONW lamp status
Sets B and C are involved in a two-party call.	—	—
Set A dials Set B.	Set A receives a busy tone.	—
Set A presses the FDIS key.	If configured, a single warning tone is provided and Set C is disconnected. Sets A and B are placed in a simple, two-party call.	The FDIS key lamp remains lit during the single warning tone period. It goes dark when Set C is disconnected.
OR		
If Set A initiates a break-in operation first (either pre-dial or post-dial)	Set A enters into a conference with Sets B and C. If configured, warning tone is provided.	The PONW lamp is lit.
Set A presses the FDIS key.	Set C is disconnected and the warning tone is removed. Sets A and B are placed in a simple, two-party call.	The PONW lamp goes dark.

Pre-dial network force disconnect operation for Meridian Digital telephones

Table 99 shows the pre-dial network force disconnect operation for a Meridian Digital telephone.

Table 99
Pre-dial network force disconnect operation for a Meridian Digital telephone

Actions	Response	Set A PONW lamp status
Sets B and C are involved in a two-party call.	—	—
Set A presses the DN key and then the FDIS key.	Set A receives dial tone.	The FDIS lamp flashes. This indicates the pre-dial mode.
Set A dials the DN of Set B.	If configured, a single warning tone is provided and Set C is disconnected. Sets A and B are placed in a simple, two-party call.	The FDIS lamp remains lit during the single warning tone period. It goes dark when Set C is disconnected.

Post-dial force disconnect operation for analog (500/2500 type) telephones

Table 100 shows the post-dial network force disconnect operation for an analog (500/2500 type) telephone.

Table 100
Post-dial network force disconnect operation for an analog (500/2500 type) telephone

Actions	Response
Sets B and C are involved in a two-party call.	—
Set A dials Set B.	Set A receives a busy tone.
Set A presses the Flash key and then dials the FDIS FFC code.	If configured, a single warning tone is provided and Set C is disconnected. Sets A and B are placed in a simple, two-party call.
OR	
If Set A initiates a break-in operation first (either predial or postdial)	Set A enters into a conference with Sets B and C. If configured, a warning tone is provided.
Set A presses the Flash key and then dials the FDIS FFC.	Set C is disconnected and the warning tone is removed. Sets A and B are placed in a simple, two-party call.

Pre-dial Network force disconnect operation for analog (500/2500 type) telephones

Table 101 shows the pre-dial network force disconnect operation for an analog (500/2500 type) telephone.

Table 101
Pre-dial network force disconnect operation for an analog (500/2500 type) telephone

Actions	Response
Sets B and C are involved in a two-party call.	—
Set A dials the FDIS FFC and then dials Set B's DN.	Set A receives a dial tone. If configured, a single warning tone is provided and Set C is disconnected. Sets A and B are placed in a simple, two-party call.

NI-2 B-channel Service Messaging

Contents

The following are the topics in this section:

Regional material statement 1441
Feature Description 1442
B-channel status categories 1443
Message Event Triggers 1444
Service message retransmission 1445
Service message collision 1445
Operating parameters 1446
Feature interactions 1447
Feature packaging 1447
Feature implementation 1448
Task summary list 1448
Feature operation 1448

Regional material statement

This feature is only available in North America. Contact your system supplier or your Nortel Networks representative to verify support of this product in your area.

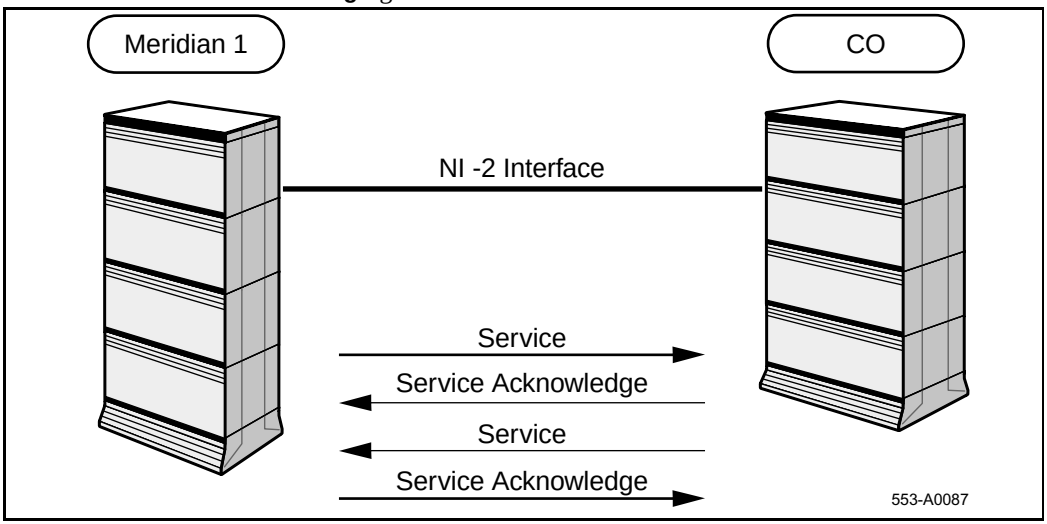
Feature Description

The NI-2 B-channel Service Messaging feature provides B-channel availability control on the NI-2 interface. With this feature, service messages communicate B-channel status changes to the far-end. This feature does the following:

- increases B-channel availability
- increases throughput on PRI service
- reduces line degradation
- reduces the number of lost calls
- minimizes the number of repeated calls on an out-of-service B-channel

When the status of a Meridian 1 B-channel changes, the Meridian 1 sends a service message to the Central Office (CO). The CO replies with a service acknowledgment and changes the status of the corresponding B-channel. When a CO sends a service message to a Meridian 1, the Meridian 1 acknowledges the service message and changes the B-channel status on the near-end. Figure 130 illustrates B-channel service messaging on the NI-2 interface.

Figure 130
NI-2 B-channel Service messaging



B-channel status categories

The following are the status categories associated with the NI-2 B-channel Service Messaging feature:

- IS - Indicates that the B-channel is in service and available for outgoing and incoming calls.
- OOS-FE - indicates that the far-end B-channel is out-of-service.
- OOS-NE - indicates that the near-end B-channel is out-of-service.

When a B-channel at the near-end goes out-of-service, the Meridian 1 sends a service message with OOS status to the far-end. The near-end B-channel status is OOS-NE. On receipt of this service message, the far-end changes the corresponding B-channel to OOS-FE.

When the near-end B-channel becomes available, the Meridian 1 sends a service message with IS status to the far-end. The near-end B-channel is temporarily placed in OOS-FE. On receipt of this service message, the far-end changes the channel status to IS and returns a service acknowledge message with the IS status to the Meridian 1. On receipt of this service acknowledge message, the near-end B-channel is placed in service.

The near-end status takes precedence over the far-end status. For example, if a near-end B-channel is in an OOS/NE state and receives an OOS request from the far-end, the final status is OOS/NE.

Table 102 lists the status scenarios when a message is received.

Table 102
Near-end status scenarios

Current Status (Near-end)	Status Received in Service Message	Final Status/ Status sent in Acknowledgement Message
OOS-NE	IS or OOS	OOS-NE/OOS
OOS-FE	IS	IS/IS
OOS-FE	OOS	OOS-FE/OOS
IS	OOS	OOS-FE/OOS
IS	IS	IS/IS

Message Event Triggers

IS trigger events

IS service messages are triggered when the following occur:

- The administrator enables the B-channel in LD 60 using the ENCH command.
- The status audit is triggered to resolve conflict between the status of the near-end and far-end of the channel. B-channels that are OOS receive either call clearing messages, channel negotiation messages, or requests for B-channel use.
- A new B-channel is provisioned and defaults to OOS-FE. The network side controls the initial service messaging requesting IS status on the user side of the B-channel.
- Alarm clear messages are received from the hardware

OOS trigger events

OOS service messages are triggered when the following occur:

- The administrator disables the channel from LD 60 using the DSCH command.

- The status audit is triggered to resolve conflict between the status of the near-end and far-end of the channel. B-channels that are OOS, receive either call clearing messages, channel negotiation messages or requests for B-channel use.
- An existing B-channel is removed from service.
- The administrator changes the channel ID in LD 14 using the MOV command.
- A PRI restart is sent or received for channels which are OOS.
- A channel is disabled for maintenance and an OOS message is sent.
- Alarm set messages are received from the hardware.
- A loop test is enabled in LD 60 for channels in a fault state.

Service message retransmission

Service messaging retransmits the message when an acknowledgment is not received within 120 seconds of the originating transmission. The number of retransmissions, up to a maximum of four, is configured in LD 17.

Service message collision

A message collision occurs when a service message is received between the time when a service message is sent and its corresponding service acknowledgement is received from the same B-channel. A re-transmission occurs after 120 seconds if an acknowledgment is not received. Table 103 lists the possible service message collision outcomes.

Table 103
Service collision outcome (Part 1 of 2)

Previous Near-end Status	Status Sent in Service Message	Colliding Status Received	Final Near-end Status
OOS-NE	IS	IS	IS
OOS-FE	IS	IS	IS
OOS-NE	IS	OOS	OOS-FE
OOS-FE	IS	OOS	OOS-FE

Table 103
Service collision outcome (Part 2 of 2)

Previous Near-end Status	Status Sent in Service Message	Colliding Status Received	Final Near-end Status
OOS-NE	OOS	IS	OOS-NE
OOS-FE	OOS	IS	OOS-NE
OOS-NE	OOS	OOS	OOS-NE
OOS-FE	OOS	OOS	OOS-NE
IS	IS	IS	IS
IS	IS	OOS	OOS-FE
IS	OOS	IS	OOS-NE
IS	OOS	OOS	OOS-NE

Operating parameters

The NI-2 B-channel Service Messaging feature operates on any Meridian 1 configured with a D-channel interface. The following PRI cards do not support the NI-2 B-channel Service Messaging feature:

- QPC757 Primary Rate Interface card.
- NTAK93 D-Channel Handler Interface card.

For the NI-2 B-channel Service Messaging feature, the far-end must support B-channel service messaging.

On an outgoing call, if the far-end triggers channel negotiation, an alternate channel is assigned. If the alternate B-channel has a near-end status of OOS-FE, the channel negotiation is accepted and the channel is placed in IS status. Otherwise, a Release Complete message is sent or a channel negotiation is triggered again.

When a setup message is received requesting an OOS channel, a Release Complete message is sent or a channel negotiation is performed. However, if the requested B-channel is OOS-FE, the status is changed to IS and the call is accepted.

With no existing call on the channel, B-channel Service messaging activates the B-channel to IS status. When there is a call on the B-channel, B-channel restart messaging is used.

The B-channel is placed in a lockout state when a restart message is sent. The lockout ends on receipt of a restart acknowledgement from the far-end. Calls cannot be placed on B-channels in the lockout state.

The identity of B-channels in the OOS-NE state are included in the PRI restart message.

To disable a PRI loop, corresponding D-channels are disabled. In this state, the B-channel service messaging is not active.

When a backup D-channel becomes active the restart procedure is triggered. Service messages containing B-channel status information are sent to all far-end B-channels in the OOS state.

If a colliding service message is received, the T323 timer stops and the original message does not retransmit.

Feature interactions

There are no feature interactions associated with this feature.

Feature packaging

The NI-2 B-channel Service messaging feature requires the following packages:

- ISDN Signaling (ISDN) package 145
- Primary Rate Access (PRA) package 146
- Multi-Serial Data Link (MSDL) package 222
- National Interface (NI-2) package 291

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 17 – Configure NI-2 B-channel Service Messaging.

LD 17 – Configure NI-2 B-channel Service Messaging.

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	CFN	Configuration Record.
ADAN	NEW DCH xx	Add a primary D-channel where: xx = 0-63.
	CHG DCH xx	Change a primary D-channel where: xx = 0-63.
IFC	NI2	NI-2 TR-1268 interface type.
BSRV	YES	NI-2 B-channel Service Messaging enabled. NO = NI-2 B-channel Service Messaging disabled (default).
BSRC	1-(2)-4	NI-2 B-channel Retransmission Counter.
...	...	

Feature operation

No specific operating procedures are required to use this feature.

NI-2 Name Display Supplementary Service

Contents

This section contains information on the following topics:

Regional material statement 1449
Feature description 1449
Operating parameters 1451
Feature interactions 1452
Feature packaging 1456
Feature implementation 1457
Feature operation 1460

Regional material statement

This feature applies only to North America. Contact your system supplier or your Nortel Networks representative to verify support of this product in your area.

Feature description

Meridian X11 Release 25.40 introduces the NI-2 Name Display Supplementary Service (NDS). The NI-2 Name Display Supplementary Service extends the Meridian 1 capability to support name display on National ISDN-2 (NI-2) interfaces. This feature provides the following:

- calling name information on outgoing and incoming calls
- Connected/Alerting name information to incoming calls and from outgoing calls

The NDS feature retains the existing user interface for Meridian Customer Defined Network (MCDN) name display capabilities.

To enable this feature, configure each D-channel's remote capability as NDS. The calling name is sent in the SETUP message. The Connect/Alerting name is sent in the CONNECT/ALERT message.

The display of the name information at the far-end is controlled by the programming at the originating switch and the terminating switch. The status of the Presence Indicator (PI) depends on how the Name Display Allowed/Name Display Denied (NAMA/NAMD) Class of Service is configured on the telephone at the near-end.

The presentation status from the near-end is overridden using the Calling Party Privacy (CPP) or Calling Party Privacy Override (CPPO) features.

The display on the far-end is determined by the Call Party Name Display Allowed (CNDA) or Call Party Name Display Denied (CNDD) Class of Service (CLS) configured on the far-end telephone.

Table 104 describes the presentation status of the originating node (the near-end) if Calling Party Privacy is not implemented.

Table 104
Presentation status of the originating node without Calling Party Privacy (CPP)

CLS	Presentation Indicator
NAMA	Presentation Allowed
NAMD	Presentation Denied

Table 105 describes the presentation status of the originating node (the near-end) with CPP per-line blocking Class of Service (CLS) implemented.

Table 105
Presentation status of the originating node with CPP per-line blocking CLS

CLS	Presentation Indicator
NAMA + Calling Party Number and Name Per-Line Blocking De-activated (CLBD)	Presentation Allowed
NAMA + Calling Party Number and Name Per-Line Blocking Activated (CLBA)	Presentation Denied
NAMD + CLBD	Presentation Denied
NAMD + CLBA	Presentation Denied

Table 106 describes the presentation status of the originating node (the near-end) with CPP per-line blocking Class of Service (CLS) and the dialed CPP Flexible Feature Code (FFC).

Table 106
Presentation status of the originating node with CPP per-line blocking CLS and FFC dialed

CLS	Presentation Indicator
NAMA + CLBA + CPPO FFC dialed	Presentation Allowed
NAMA + CLBD + CPPO FFC dialed	Presentation Allowed
NAMA + CLBD + CPP FFC dialed	Presentation Denied
NAMD + CLBA + CPPO FFC dialed	Presentation Allowed
NAMD + CLBA + CPP FFC dialed	Presentation Denied
NAMD + CLBD + CPPO FFC dialed	Presentation Allowed
NAMD + CLBD + CPP FFC dialed	Presentation Denied

Operating parameters

The NI-2 Name Display Supplementary Service complies with the GR-1367 Bellcore specifications for name delivery on PRI trunks.

The Name Display is not displayed on the far-end if this feature is not supported by the CO or PBX to which the far-end is connected.

With this feature, display names can be up to 15 characters long. Display names longer than 15 characters are truncated on the receiving telephone.

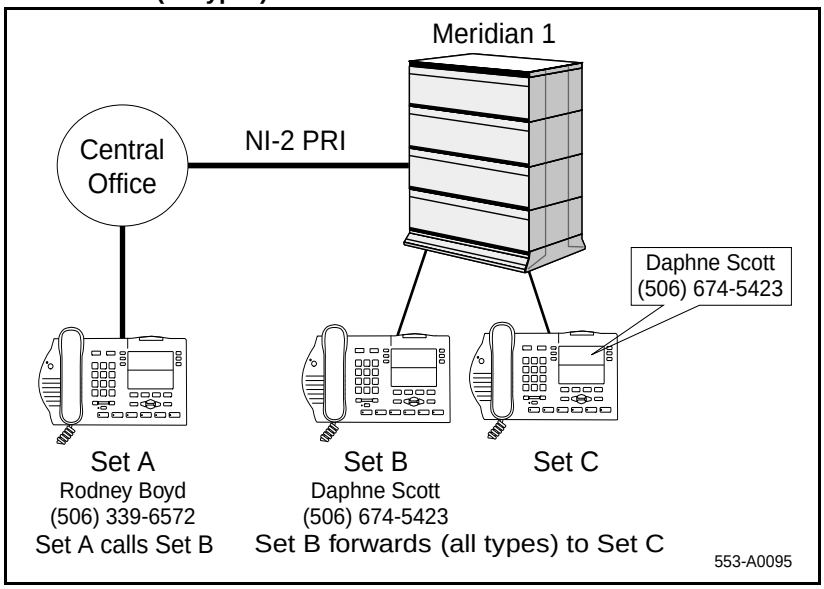
Calls with the Calling Party Privacy (CPP) Flexible Feature Code (FFC) override NDS.

Feature interactions

Call Forward (all types)

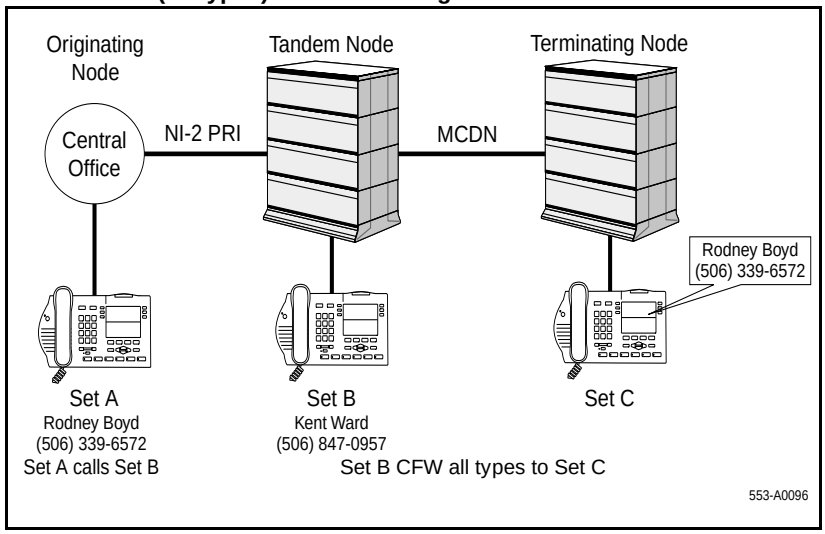
In a stand-alone environment, Set A calls Set B. The call is forwarded to Set C. Set C displays Set B's name information. See Figure 131.

Figure 131
Call Forward (all types) in a stand-alone environment



In a networking environment, Set C displays Set A's information. See Figure 132.

Figure 132
Call Forward (all types) in a networking environment



Call Hold

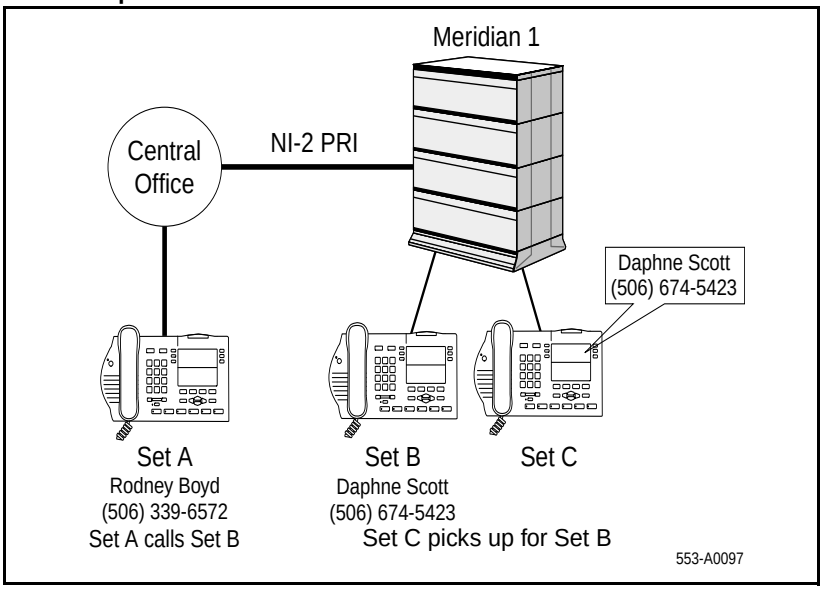
When an incoming call with Name Display Allowed is put on hold, the receiving telephone clears the name information from the display screen. When the call is re-established, the name information is re-displayed.

Call Pickup

Call Pickup Network Wide

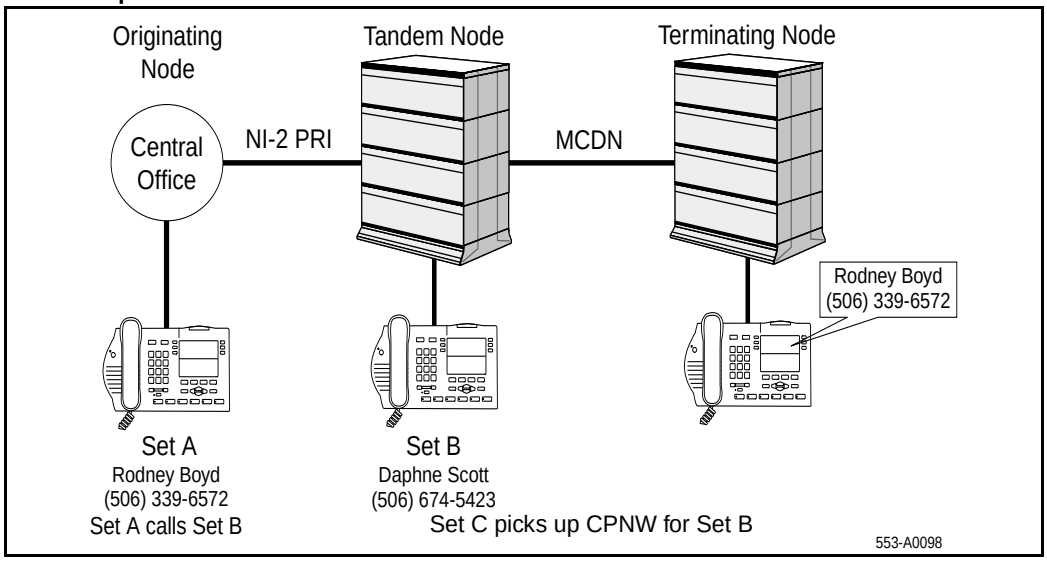
In a stand-alone environment, Set A calls Set B. Set C picks up the call for Set B. Set C displays Set B's name information. See Figure 133.

Figure 133
Call Pickup in a stand-alone environment



In a networking environment, Set C displays Set A's name information. See Figure 134.

Figure 134
Call Pickup Network Wide



Call Transfer

Set A calls Set B. Set B transfers the call to Set C. Set C displays Set A's name information. This applies to both stand-alone and networking environments.

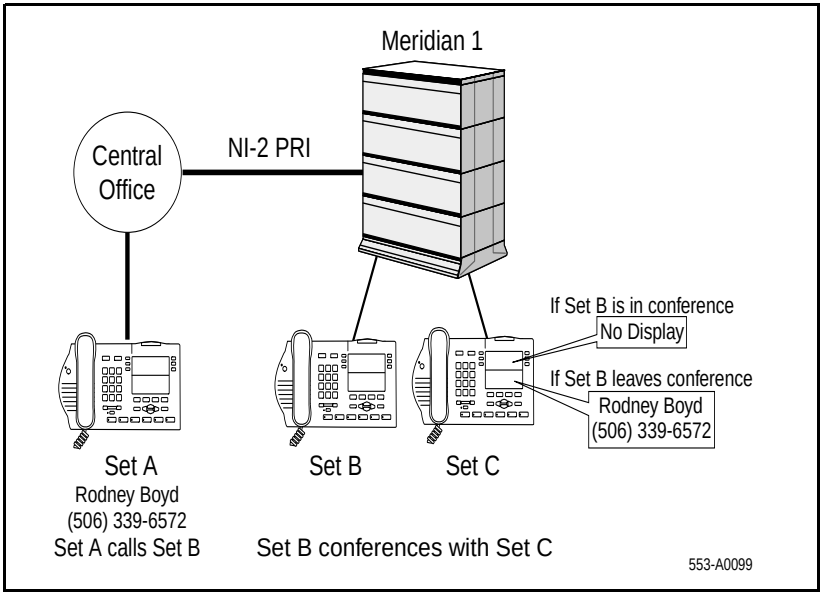
Calling Party Privacy

The Calling Party Privacy (CPP) feature overrides NDS.

Conference

Set A calls Set B. Set B conferences Set C. Set B and Set C clear the name information from the display screen. If Set B leaves the conference, Set A's name information displays on Set C. See Figure 135.

Figure 135
Conference call



Hunt

In a stand-alone environment, Set A calls Set B. The call is hunted to Set C. Set C displays Set B's name information.

In a networking environment, Set C displays Set A's name information.

Name Display for Dialed Number Identification Services

If DNAM = YES for incoming IDC routes, the DNIS number and name for Incoming Digit Conversion (IDC) DNIS NI-2 incoming calls is displayed instead of the calling name.

Feature packaging

The NI-2 Name Display Supplementary Service feature introduces the following package:

- NI-2 Name Display Service (NDS) package 385

This feature also requires the following existing packages:

- Call Party Name Display (CPND) package 95
- Integrated Services Digital Network (ISDN) package 145
- 1.5 Mbps Primary Rate Access (PRS) package 146
- Multi-purpose Serial Data Link (MSDL) package 222
- NI-2 TR-1268 Interface Basic Call Feature (NI-2) package 291
- Calling Party Privacy (CPP) package 301

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 17 – Configure the remote capability on the NI-2 PRI D-channel as Name Display Service (NDS).

2 LD 95 – Create a new Call Party Name Display (CPND) name string, if not already configured.

3 LD 10 – Allow NDS on analog (500/2500 type) telephones.

4 LD 11 – Allow NDS on Meridian 1 proprietary telephones.

5 LD 12 – Allow NDS on Attendant Console.

6 LD 57 – Define the Calling Party Privacy (CPP) Flexible Feature Code (FFC) for Analog (500/2500 type) and Meridian 1 proprietary telephones.

LD 17 – Configure the remote capability on the NI-2 PRI D-channel as Name Display Service (NDS).

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	ADAN	Action Device and Number.
ADAN	CHG DCH xx	Change D-channel where: xx = 0 – 63.
....	....	
IFC	NI2	NI-2 TR-1268 Interface type.

Prompt	Response	Description
RCAP		Remote Capabilities.
	NDS	Implement NI-2 Name Display Service.
	XNDS	Remove NDS.

LD 95 – Create a new Call Party Name Display (CPND) name string, if not already configured.

Prompt	Response	Description
REQ	NEW	Add new data.
TYPE	NAME	Create a new name string.
CUST	xx	Customer number.
...		
DN	xxxx	Directory Number.
NAME	aaaa	Calling Party Name Display (CPND) name (maximum 15 characters).

LD 10 – Allow NDS on analog (500/2500 type) telephones.

Prompt	Response	Description
REQ:	CHG	Change existing data.
TYPE:	500/2500	Telephone type.
CUST	xx	Customer number.
...	...	
FTR	CPND	Allow CPND name assignment on this telephone (not required if CPND is enabled in LD 95).
CLS	(CNDD)	Called Party Name Display denied.
	CNDA	Called Party Name Display allowed (applies only to portable, personal telephones). Allowed if WRLS=Yes.
CLS	(NAMD)	Name Display Denied on the far-end.
	NAMA	Name Display Allowed on the far-end.

LD 11 – Allow NDS on Meridian 1 proprietary telephones.

Prompt	Response	Description
REQ:	NEW CHG	Add new data. Change existing data.
TYPE:	xxxx	Telephone type, where: xxxx = SL1, 2006, 2008, 2009, 2016, 2018, 2112, 2216, 2317, 2616 or 3000.
CUST	xx	Customer number.
...		
CLS	(CNDD)	Call Party Name Display denied on this telephone.
	CNDA	Call Party Name Display allowed on this telephone.
CLS	(NAMD)	Name Display denied on the far-end.
	NAMA	Name Display allowed on the far-end.

LD 12 – Allow NDS on Attendant Console.

Prompt	Response	Description
REQ	NEW	Add new data.
TYPE	xxxx	Console type where: xx = 1250 or 2250.
CUST	xx	Customer number.
....	....	
CPND	(CNDD)	Call Party Name Display denied.
	CNDA	Call Party Name Display allowed.

LD 57 – Define the Calling Party Privacy (CPP) Flexible Feature Code (FFC) for analog (500/2500 type) and Meridian 1 proprietary telephones.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	FFC	Flexible Feature Code.
CUST	xx	Customer number.
...	...	

CPP	xxxx	Calling Party Privacy FFC (typically *67). CPP is only prompted if the CPP package is equipped.
CPPO	xxxx	Calling Party Privacy Override. CPPO is only prompted if the CPP package is equipped.

Feature operation

No specific operating procedures are required to use this feature.

NI-2/QSIG Compliance Update

Contents

The following are the topics in this section:

Description 1461
Operating parameters 1462
Feature interactions 1462
Feature packaging 1463
Feature implementation 1464
Task summary list 1464
Feature operation 1465

Description

The NI-2/QSIG Compliance Update feature makes the NI-2 and QSIG interfaces compliant with the latest standards documents. This feature applies to both Basic Rate Interface and Primary Rate Interface connections.

Note: ISDN BRI trunking is not available in North America.

Compliancy with the standards has evolved as follows:

- ETSI QSIG basic call functionality now complies with the ETS 300-172, fourth edition (1997) standards document. Initially, support for the ISDN ETSI QSIG interface and the basic call capability was introduced. This version of the interface was based on the ETS 300-172, first edition (1990) document.

- ISO QSIG basic call functionality now complies with the North American standards document, ISO/IEC 115172 second edition. Initially, support for the ISDN ISO QSIG interface and the basic call capability was introduced. This version of the interface was based on the ISO/IEC 115172 first edition document.
- National ISDN-2 (NI-2) basic call functionality now complies with the latest North American standards document, Bellcore TR-NWT-001268.

The NI-2/QSIG Compliance Update feature changes the way the Meridian 1 handles a recoverable error. Instead of sending incorrect call state information, the Meridian 1 now sends a correct call state in the STATUS message.

The mandatory parts of the STATUS message are: CAUSE (indicates type of error) and CALL STATE. Whenever the Meridian 1 encounters a recoverable error it sends a STATUS message. Recoverable errors can be cases such as:

- the IE received is non-mandatory and unrecognized
- the IE is non-mandatory and has invalid contents

In cases such as these, the basic call can still be processed, without affecting basic services, if the call state sent does not hinder this process. All the protocol must do is report the errors.

Before the protocol compliancy was updated, the Meridian 1 sent the call state information as it existed before receiving the incoming call message with the recoverable error. This was not appropriate for other-vendor switches which dropped the call when the incorrect call state information was received. Now, the Meridian 1 sends the call state information, adjusted after the incoming call message was received. The adjusted call state information allows the other vendor switch to proceed with the basic call.

Operating parameters

Fatal errors and errors in non-call-associated messages (such as maintenance messages) are not affected by this feature. These errors continue to use the existing error reporting mechanism.

Feature interactions

There are no feature interactions specified for this feature.

Feature packaging

The following packages are required for the ISDN PRI QSIG interface:

- ISDN Signaling (ISDN) package 145
- 2 Mb PRI (PRI2) package 154
- International PRA (IPRA) package 202
- Multi-Purpose Serial Data Link (MSDL) package 222
- QSIG Interface (QSIG) package 263

The following packages are required for the ISL QSIG interface:

- ISDN Signaling (ISDN) package 145
- ISDN Signaling Link (ISL) package 147
- 2 Mb PRI (PRI2) package 154
- Multi-Purpose Serial Data Link (MSDL) package 222 (for ISL on PRI only)
- QSIG Interface (QSIG) package 263

The following packages are required for the ISDN BRIT QSIG interface:

- ISDN Signaling (ISDN) package 145
- ISDN Basic Rate Interface (BRI) package 216
- Multi-Purpose Serial Data Link (MSDL) package 222
- ISDN BRI Trunk Access (BRIT) package 233
- QSIG Interface (QSIG) package 263

The following packages are required for the PRI NI-2 interface:

- ISDN Signaling (ISDN) package 145
- Primary Rate Interface (PRA) package 146
- Multi-Purpose Serial Data Link (MSDL) package 222
- National ISDN-2 Interface (NI-2) package 291

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 17 – Assign the configuration record.

2 LD 16 – Use this overlay to define a route data block.

LD 17 – Assign the configuration record.

Prompt	Response	Description
ADAN	NEW CHG OUT MOV DCH xx	New, change, out, or move a D-channel.
...		
IFC	ISIG ESIG	Interface ID for ISO QSIG. Interface ID for ETSI QSIG.
TIMR	(NO) YES	NO = skip timer prompt. YES = change timer value.
T310	10-(30)-60	10-60 seconds (one-second increments). 30 seconds is the default value.

LD 16 – Use this overlay to define a route data block.

Prompt	Response	Description
REQ	NEW CHG	New or change.
TYPE	RDB	Route data block.
...		
DGTP	PRI PRI2 BRI	Digital route type.
IFC	ISIG ESIG	New DCH interface ID.

Feature operation

There are no operating procedures specified for this feature.

NI-2 Call By Call Service Selection

Contents

The following are the topics in this section:

Regional material statement 1467
Description 1468
Provisioning a master route and service routes 1470
Service routes for public network calls 1472
NI-2 CBC service route treatment 1473
Differences between ISA, CBC, and NI-2 CBC 1474
Operating parameters 1477
Feature interactions 1477
Feature packaging 1478
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Feature implementation 1480
Task summary list 1480
Sample configuration 1484
Feature operation 1487
Feature testing 1487

Regional material statement

This feature is only available in North America. Contact your system supplier or your Nortel Networks representative to verify support of this product in your area.

Description

The National ISDN-2 (NI-2) Call By Call (CBC) Service Selection feature provides a standardized version of call by call service over an NI-2 TR-1268 interface, as defined in the Bellcore Technical Reference Specification TR-NWT-001270. It is intended that NI-2 CBC apply to all Class 5 type local exchanges complying with the NI-2 TR1270 standard.

Prior to the introduction of this feature, proprietary call by call capabilities were offered by Nortel's Integrated Services Access feature (ISA) Call By Call Type service for DMS switches (such as the DMS-100), and Lucent's Call By Call Service Selection for 5ESS Local Exchange Carriers. Table 108, "Differences between Nortel's ISA, Lucent's CBC, and NI-2 CBC," on page 1474 provides a summary of the functional differences between the three offerings.

> ***Note:*** The ISA Call By Call Type service and the NI-2 Call By Call Service Selection feature can co-exist on the same PBX.

NI-2 Call By Call Service Selection allows multiple service routes to share the same common pool of B-channels, rather than using dedicated routes that require each service route to have its own trunks. The channels are assigned to a service on a per call basis.

Figure 136 depicts a configuration using dedicated facilities, while Figure 137 shows an NI-2 Call By Call Service Selection configuration. Figure 138 provides a graphical representation of the NI-2 CBC master route and service routes.

. The NI-2 Call By Call Service Selection feature provides all of the NI-2 TR-1268 Basic Call services. Please refer to the 'National ISDN-2 TR-1268 PRI Interface' feature module for a a description of the services that are offered.

Figure 136
Dedicated facilities configuration

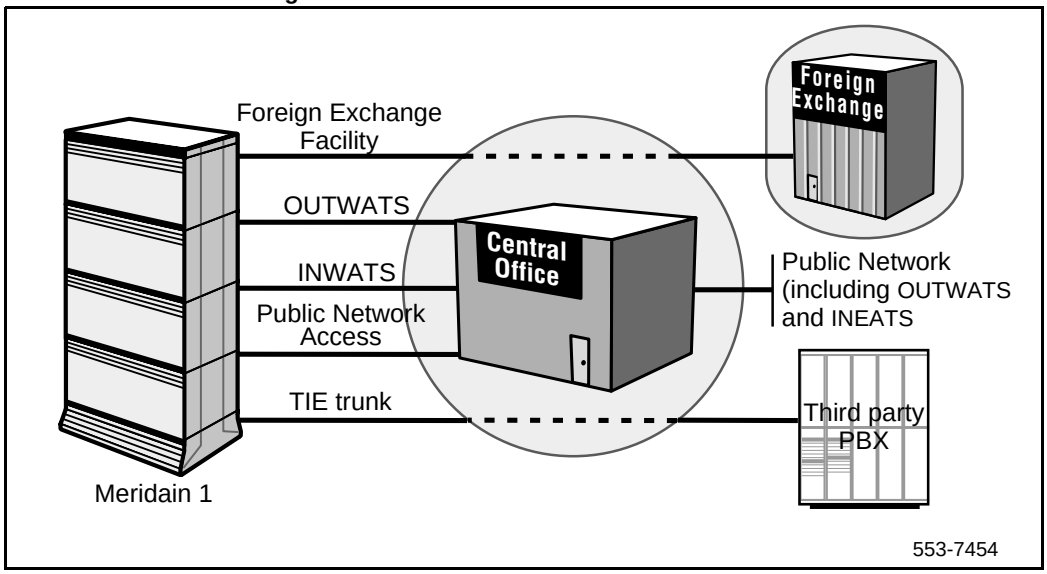


Figure 137
NI-2 Call By Call Service Selection configuration

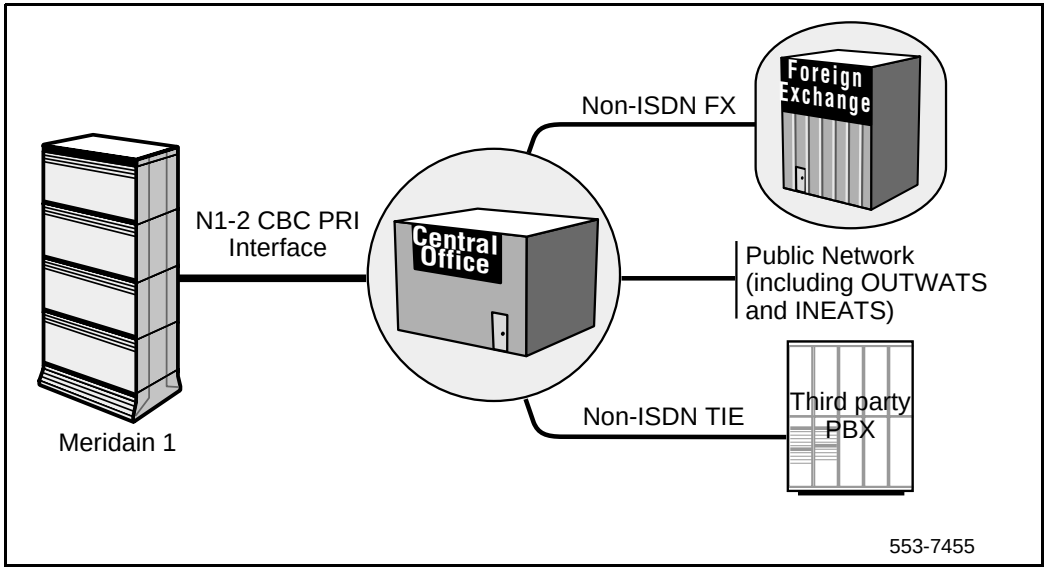
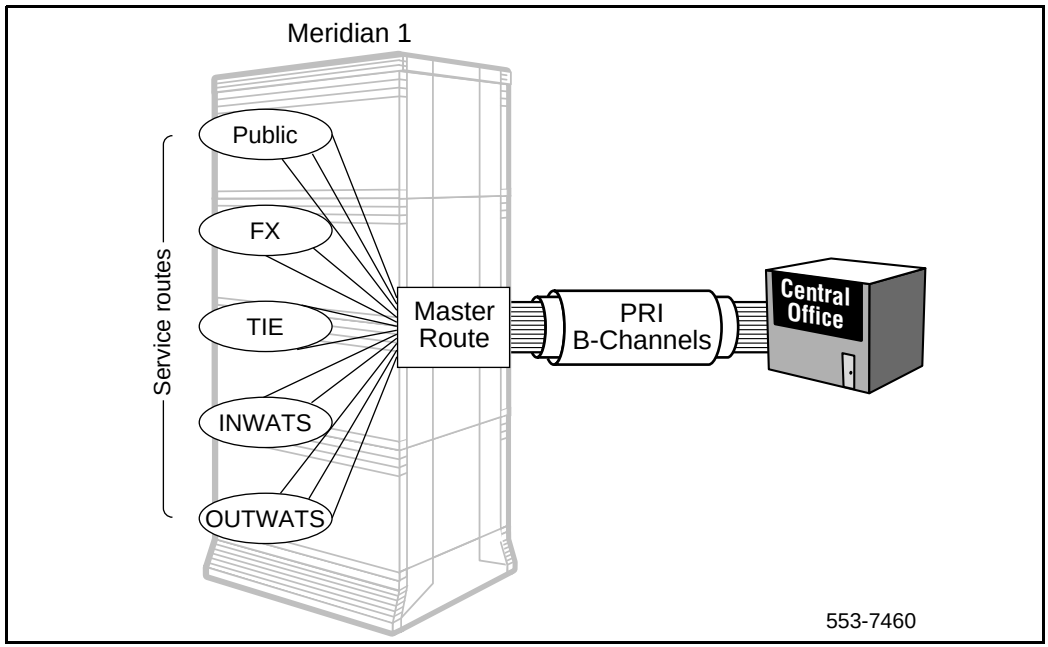


Figure 138
NI-2 CBC master route and service routes on the Meridian 1



Provisioning a master route and service routes

NI-2 Call By Call Service Selection is provisioned by configuring a trunk route as an NI-2 Call By Call Service Selection master route, and associated service routes. A master route contains a list of B-channels (trunks) to be shared by the different service routes. Service routes do not have dedicated trunks. They are associated with the master route and share trunks for different Call By Call services. Calls from the Central Office to the Meridian 1 are offered over the CBC master route.

The NI-2 CBC master route is defined in Overlay 16. The associated list of B-channels (trunks) is defined using Overlay 14. Then, the service routes are configured, also using Overlay 16. When configuring the service routes, the type of service to be carried over the B-channels for the NI-2 PRI interface is defined as a decimal value, as follows:

0 = Public call service (No Network Specific Facility IE is sent, since COT/DID routes are used)

19 = FX (Foreign Exchange) service

20 = TIE service

17 = Inward Wide Area Telecommunications Service (INWATS) service

18 = Outward Wide Area Telecommunications Service (OUTWATS) service. Information pertaining to the band number and the Inter-Exchange Carrier is stored in the service route. Three OUTWATS services may be accessed:

- IntraLATA OUTWATS, provided by a local service provider
- InterLATA OUTWATS, provided by a carrier other than that of the local service provider and
- Banded OUTWATS, using bands which each represents a geographical area to which a subscriber can place a call at a special tariff level

Lucent proprietary call by call services are as follows (these values are defined in the facility coding field in the NSF IE in order for the Meridian 1 to recognize the Lucent call by call services):

- 00001 = Access to Virtual Private Network (such as Lucent's Software Defined Network service)
- 00010 = MEGACOM 800
- 00011 = MEGACOM
- 00110 = ACCUNET switched digital service
- 00111 = International long distance service
- 01000 = International 800
- 01011 = Electronic Tandem Network
- 01101 = Private Virtual Network
- 10000 = DIAL IT and Lucent MultiQuest

For each FX and TIE trunk service, a Facility Number is assigned.

The maximum number of trunks limited by each service route is entered when configuring the service routes. The maximum number of channels per service (a maximum value is required by the Bellcore Technical Reference Specification) is controlled by the Central Office, and assigned at the time of subscription. It is this value that must be entered in Overlay 16.

There is no minimum limit specified by the Bellcore Technical Reference Specification, therefore no minimum value is assigned by the Central Office, or defined on the Meridian 1.

Engineering consideration pertaining to service maximums

The maximum value of trunks defined for any service type cannot exceed the network maximum, but the total of all maximums combined may be greater than the network maximum.

For example, in a single 23B+D span, two service routes may be configured, each with a maximum of 15 trunks (B-channels). Even though the combined number of B-channels (30) is greater than the network maximum (23), a minimum of 8 B-channels would be left available for other service routes.

For an incoming call to the Meridian 1, if the maximum number of trunks defined for a service has been reached, the Meridian 1 will return a “Release Complete” message to the Central Office, with the “Cause” value set to “User Busy”. This allows the Central Office to return a busy tone to the caller.

Service routes for public network calls

NI-2 Call By Call Service Selection uses the Network Specific Facility (NSF) Information Element (IE) to indicate the requested service in the call request. If no NSF IE is included, the call is treated as a TR-1268 public network call (CO or DID).

Multiple service routes can be configured on a master route to serve outgoing public network calls, but only one service route may be specified in the master route to serve incoming public network calls (this is done using the IPUB prompt in Overlay 16). The route type for these service routes may be COT and DID. The result is that a system may be configured to handle public network calls with one incoming route and multiple outgoing routes, or one incoming and outgoing route with multiple outgoing routes.

NI-2 CBC service route treatment

Each service route stores the information, pertaining to a particular subscribed service, required to initiate or terminate a call. The information is transmitted to, or received from, the network by means of an NSF IE contained in the outgoing or incoming SETUP message.

Originating treatment (Meridian 1 to Central Office)

The Meridian 1 can designate the desired service to the Central Office, on a call-by-call basis. This is done by means of an NSF IE in the outgoing SETUP message. The NSF IE is built using the information configured in the service route. The SETUP message is sent by seizing a B-channel from a pool of channels associated to the CBC master route.

Termination treatment (Central Office to Meridian 1)

The Central Office, when offering a call to the Meridian 1 over the CBC master route, indicates in the NSF IE the type of service of the incoming call. The NSF IE contains the information required to identify a service route and to handle further call processing. The termination of NI-2 CBC service routes is based on the existing Nortel's Integrated Services Access feature (ISA) call by call service treatment, and summarized in Table 107.

Table 107
Call termination for NI-2 CBC service route

TKTP	**AUTO[a] = No**				**AUTO = Yes**	
	DNIS[b] = No		DNIS = Yes		DNIS = No	DNIS = Yes
	IDC[c] = No	IDC = Yes	IDC = No	IDC = Yes		
COT	attendant	N/A[d]	N/A	N/A	AUDN[e]	N/A
FEX	attendant	IDC digit	N/A	IDC digit	AUDN	N/A
WAT	attendant	IDC digit	N/A	IDC digit	AUDN	AUDN[f]
DID	last n CAD digit[g]	IDC digit	N/A	IDC digit	AUDN	AUDN[h]
TIE	CAD	IDC digit	N/A	IDC digit	AUDN	AUDN[i]

a. AUTO = Autoterminate.
b. DNIS = Direct Number Identification Service.

c. IDC = Incoming Digit Conversion.
d. N/A = Not supported.
e. AUDN = Autoterminate DN. AUDN in LD 16 has the same significance as ATDN in LD 14.
f. Must be an ACD DN.
g. Last n CAD digit = the last n digits of the Called Party Number IE, where 'n' is defined using prompt LDN0 in LD 15.
h. Must be an ACD DN.
i. Must be an ACD DN.

Differences between ISA, CBC, and NI-2 CBC

Table 108 summarizes the differences between Nortel's ISA, Lucent's Call By Call Service Selection, and NI-2 Call By Call Service Selection.

Table 108
Differences between Nortel's ISA, Lucent's CBC, and NI-2 CBC (Part 1 of 4)

Nortel ISA	Lucent CBC	NI-2 CBC
Proprietary (interface specific to DMS-100 and DMS-250).	Proprietary (interface specific to Lucent 5ESS Local Exchange Carriers).	Bellcore-based standard CBC service (independent of switch type).

Table 108
Differences between Nortel's ISA, Lucent's CBC, and NI-2 CBC (Part 2 of 4)

Services: — Public — PRIVATE — INWATS — OUTWATS — TIE — FX	Services: — ACCUNET — SDN — MEGACOM — MEGACOM 800 — WATB — WATM — LDS — IWAT — I800	Standardized Services: — TR-1268 Public (CO or DID) — FX — TIE — OUTWATS (IntraLATA, Bands, and InterLATA) — INWATS Non-standardized Services: — e.g., Lucent proprietary services, as follows: • Access to operator • Access to Exchange Carrier Services (call by call services) • Access to Virtual Private Network • MEGACOM/ MEGACOM 800 • ACCUNET switched digital service • International long distance service • International 800 • Electronic Tandem Network • Private Virtual Network • DIAL IT and Lucent MultiQuest
Nortel ISA	**Lucent CBC**	**NI-2 CBC**
CBC calls are routed according to the Service Identifier in Service Parameter of the NSF IE.	CBC calls are routed according to the service specified by the Facility Coding Value in the NSF IE.	CBC calls are routed according to the service specified by the Facility Coding Value and the Service Parameter in the NSF IE.

Table 108
Differences between Nortel's ISA, Lucent's CBC, and NI-2 CBC (Part 3 of 4)

Up to 512 service routes can be configured on the Meridian 1 (one per Service Identifier value), enabling access to 512 possible services.	Only one service route can be configured per service type on the Meridian 1, enabling access to only nine possible services. — 1 ACCUNET — 1 SDN — 1 MEGACOM — 1 MEGACOM 800 — 1 WATB — 1 WATM — 1 LDS — 1 IWAT — 1 I800	Up to 512 service routes can be configured on the Meridian 1, enabling access to a maximum of 512 possible services (see Note 1). — Public (COT or DID) (see Note 2) — 1 INWATS — OUTWATS (98 bands, 1 IntraLATA, 1 InterLATA — Up to 512 FX or TIE (for FX and TIE, a Facility Number may be assigned in LD 16 for each service route)
The operation mode for TIE trunks is send (see Note 1).	N/A	The operation mode for TIE trunks can be send (see Note 3) or cut-through (see Note 4).
The minimum and maximum function are defined on a per service route basis.	The minimum and maximum function are defined on a per service route basis.	The maximum value is defined on a per service route basis (a maximum is required by the Bellcore Specification). The maximum value is also defined by the serving Central Office. There is no minimum value allowed by the Bellcore Specification.

Table 108
Differences between Nortel's ISA, Lucent's CBC, and NI-2 CBC (Part 4 of 4)

One Public service route (no NSF IE) can be configured for multiple incoming and outgoing trunks, with a maximum and a minimum value.	N/A	A system may be configured to handle public network calls with one incoming route and multiple outgoing routes, or one incoming and outgoing route with multiple outgoing routes. The route type for these service routes may be COT and DID.

Note 1: The maximum cannot be greater than 512 for all call types.

Note 2: Multiple service routes can be configured on a master route to serve outgoing public network calls, but only one service route may be specified in the master route to serve incoming public network calls. The route type for these service routes may be COT and DID. The result is that a system may be configured to handle public network calls with one incoming route and multiple outgoing routes, or one incoming and outgoing route with multiple outgoing routes

Note 3: For a TIE trunk operating in send mode, the Central Office collects and screens the called digits before sending the digits to the Class II equipment or PBX at the end of the TIE trunk.

Note 4: For a TIE trunk operating in cut-through mode, the Central Office does not collect the called digits. The Class II equipment or the switch at the end of the TIE trunk are allowed to exchange inband information, such as dial tone and address information.

Operating parameters

NI-2 Call By Call Service Selection does not support the TIE trunk cut-through mode.

The maximum number of NI-2 Call By Call Service Selection routes that can be configured on a Meridian 1 is 512.

The maximum number of trunks per route is 254 per master route.

Feature interactions

Calling Party Privacy

The Calling Party Privacy feature allows a user the option of restricting the display of the calling number on the set of the called party. The INWATS service requires that the CLID always be displayed. Therefore, subscribers to INWATS cannot restrict the display of the calling number, even though they have the Calling Party Privacy feature active.

Feature packaging

The NI-2 Call By Call Service Selection feature requires the NI-2 Call By Call (NI2 CBC) package 334.

The following packages are also required as dependencies:

- National ISDN-2 (NI2) package 291
- Integrated Services Digital Network (ISDN) package 145
- Primary Rate Access (PRA) package 146
- Multi-purpose Serial Data Link (MSDL) package 222

Traffic measurement output

The TFC002 traffic report has been updated for NI-2 CBC as shown by Table 109:

Table 109
TFC002 NI-2 CBC trunks format

System ID	TFC002
Customer Number	
Route Number	Trunk Type
Trunks equipped	Trunks working
Incoming usage	Incoming peg count
Outgoing usage	Incoming peg count
Outgoing overflow	All trunks busy
Toll peg count	
Incoming CBC peg count	Outgoing CBC peg count

Trunk Type

For an NI-2 CBC master route, ‘CBCT’ is output in this field. For an NI-2 CBC service route, one of the following is output in the field, based on the trunk type of the route:

- FEX

- TIE
- CO
- DID
- WATS

Trunks Equipped

This field indicates the total number of trunks configured for the NI-2 CBC master route (this field would always be 0 for service routes).

Trunks Working

This field indicates the total number of trunks enabled (working) for the NI-2 CBC master route (this field would always be 0 for service routes).

Incoming usage

This field indicates the total number of incoming routes, for both the NI-2 CBC master route and service routes.

Outgoing usage

This field indicates the total number of outgoing routes, for both the NI-2 CBC master route and service routes.

Outgoing overflow

This field indicates the number of outgoing overflow routes for the NI-2 CBC master route (this field would always be 0 for service routes).

Toll peg count

This field indicates the toll peg count for the NI-2 CBC master route (this field would always be 0 for service routes).

Incoming peg count

This field indicates the incoming peg count increment when an incoming trunk call on the NI-2 CBC master route becomes idle (this field would always be 0 for service routes).

Outgoing peg count

This field indicates the outgoing peg count increment when an outgoing trunk call on the NI-2 CBC master route becomes idle (this field would always be 0 for service routes).

All Trunk Busy

This field indicates the increment when all trunks (incoming and outgoing) on the NI-2 CBC master route becomes busy. For a service route, this field indicates the increment when the number of calls (both incoming and outgoing) for the service route has reached its maximum value.

Incoming CBC peg count

This field indicates the incoming peg count for an NI-2 CBC service route.

Outgoing CBC peg count

This field indicates the outgoing peg count for an NI-2 CBC service route.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 17 – Configure the primary D-channel for the NI-2 Basic Call Service.

2 LD 16 – Configure the NI-2 Call By Call Service master route.

3 LD 14 – Define the associated list of trunks (B-channels) that are to be shared by the NI-2 CBC service routes

4 LD 16 – Configure the NI-2 CBC service routes.

LD 17 – Configure the primary D-channel for the NI-2 Basic Call Service.

Prompt	Response	Description
REQ	NEW	Add new data.
TYPE	CFN	Configuration Record.
ADAN	NEW DCH xx	Add a primary D-channel where: xx = 0-63.
CTYP	MSDL	Supported only on Multi-purpose Serial Data Link (MSDL) or Downloadable D-channel cards.
...		

USR	PRI	D-channel mode.
IFC	NI2	NI-2 TR-1268 interface type.
CO_TYPE		Central Office switch type (prompted only if IFC = NI2).
	(STD) ATT	STD = Totally compatible with Bellcore standard. ATT = Lucent 5ESS.
PRI	lll nn	lll = PRI loop using the same D-channel (0,1,...159) nn = Interface identifier (2-15)
...		

LD 16 – Configure the NI-2 Call By Call Service master route.

Prompt	**Response**	**Description**
REQ	NEW CHG	Add new data. Change existing data.
TYPE	RDB	Route Data Block.
DMOD	1-127	Default Model number for this route (Option 11C)
CUST	xx	Customer number.
ROUT	0-511 0-127	Route number. For Option 11C.
TKTP	CBCT	The trunk type is a Call By Call master route.
...		
ISDN	YES	ISDN route.
- IFC	NI2	Interface type is NI-2.
- IPUB	0-511 0-127	Service route to be used for incoming network calls. For Option 11C.
...		
- - PNI	1-32700	Private Network Identifier.

...		
ICOG	IAO ICT OGT	IAO = The trunk is incoming and outgoing. ICT = The trunk is incoming only. OGT = The trunk is outgoing only.
...		

LD 14 – Define the associated list of trunks (B-channels) that are to be shared by the NI-2 CBC service routes

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	CBCT	Call By Call trunk.
TN	l ch	Loop and channel for digital trunks, where: l = Previously defined loop number (0-159). ch = channel (1-24).
CUST	xx	Customer number.
RTMB	0-511 1-510	CBC master route and member number.
...		

LD 16 – Configure the NI-2 CBC service routes.

Note: Up to 512 service routes can be configured using this procedure.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	RDB	Route Data Block.
CUST	xx	Customer number.
ROUT	xx	Service route number, must be different than the value enters for the master route.

...		
TKTP	 TIE COT DID WAT FEX	Service trunk type. TIE Central Office Direct Inward Dial Wide Area Telecommunications Service Foreign Exchange
...		
ISDN	YES	ISDN route.
- IFC	NI2	Interface type is NI-2.
- CBCR	YES	Service route indicator.
- - RTN	0-511 0-127	Master route number, as previously defined in LD 16. For Option 11 C.
- - SRVC	(0)-31	Decimal value of the service provisioned for NI-2. Prompted only if IFC = NI2. 0 = Public call service 19 = FX (Foreign Exchange) service 20 = TIE service 17 = Inward Wide Area Telecommunications Service (INWATS) service 18 = Outward Wide Area Telecommunications Service (OUTWATS) service. Lucent proprietary call by call services may also be defined here. Refer to page 1471 for a list of these values.
- - FACN	(0)-99999	TIE or FX facility number. Prompted only if IFC = NI2, and SRVC = 19 (FX) or 20 (TIE).
- - BAND	(0)-99	OUTWATS band number. Prompted only if IFC= NI2 and SRVC = 18 (OUTWATS).
- - IEC	(0)-xxx (0)-xxxx	Inter-Exchange Carrier providing the service. Prompted if IFC = NI2 and SRVC = 0-16, 18, or 21-31.

- - MAX ...	xxx	Maximum number of trunks for the service route. This value must be the same as the value assigned by the Central Office at the time of subscription.

Sample configuration

The following provides a sample configuration of the NI-2 CBC feature.

Load Overlay 17 and configure a primary D-channel for the NI-2 Basic Call Service.

Prompt	Response	Description
REQ	NEW	Add configuration information.
TYPE	CFN	Configuration Record.
ADAN	NEW DCH 1	Add a primary D-channel for NI-2, where 1 is the primary D-channel number.
CTYP	MSDL	Supported only on Multi-purpose Serial Data Link (MSDL) or Downloadable D-channel cards.
...		
USR	PRI	D-channel mode.
IFC	NI2	NI-2 TR-1268 interface type.
CO_TYPE	STD	Central Office switch type for the NI-2 interface. STD = Totally compatible with Bellcore standard.
PRI	1 2	1 = PRI loop using the same D-channel (0,1,...159) 2 = Interface identifier (2,3,...15)
...		

Load Overlay 16 and configure a trunk route as an NI-2 Call By Call Service Selection master route.

Prompt	Response	Description
REQ	CHG	Change data.
TYPE	RDB	Route Data Block.
DMOD	1-127	Default Model number for this route (Option 11C)
CUST	0	Customer number.
ROUT	0	Master route number.
TKTP	CBCT	The trunk type is a Call By Call master route.
DTRK	YES	Trunk route is digital.
DGTP	PRI	Trunk type is digital.
ISDN	YES	ISDN is used.
...		
- IFC	NI2	Interface type is NI-2.
- IPUB	1	Service route for incoming public network calls.
...		
- - PNI	1	Customer's Private Network Identifier.
...		
ICOG	IAO	The trunk is incoming and outgoing.
...		

Load Overlay 14 and define the associated list of trunks (B-channels) that are to be shared by the NI-2 CBC service routes.

Prompt	Response	Description
REQ	CHG	Change data
TYPE	CBCT	Call By Call trunk.
TN	0 1	Loop and channel for digital trunks, where: 0 = Previously defined loop number (0-159). 1 = channel (1-24).
CUST	0	Customer Number.
RTMB	0 1	CBC master route and member number.
...		

Load Overlay 16 and define the NI-2 CBC service routes. Up to 512 service routes can be configured using this procedure.

Prompt	Response	Description
REQ	NEW CHG	Add or change data.
TYPE	RDB	Route Data Block.
CUST	0	Customer number.
ROUT	1	Service route number.
...		
TKTP	TIE	Service trunk type.
...		
ISDN	YES	ISDN route.
- IFC	NI2	Interface type is NI-2.
- CBCR	YES	Service route indicator.

- - RTN	0	Master route number, as previously defined in LD 16, with which the service routes are associated.
- - SRVC	20	Decimal value of for TIE service.
- - FACN	20	TIE Facility Number.
- - MAX	1	Maximum number of trunks for the service route. This value must be the same as the value assigned by the Central Office at the time of subscription.
...		

Feature operation

No specific operating procedures are required to use this feature.

Feature testing

Test each PRI trunk to ensure that the Meridian 1 completes an NI-2 CBC call. Run the following test for each of the available call types: TIE, Public (COT, DID), FX, INWATS, and OUTWATS.

To test NI-2 CBC, follow steps 1 through 8.

1 Select a PRI to be tested.

2 Access LD 60. Use STAT command on all pertinent B-channels.

3 Set all the Maximum value in all service routes to 1 (the Central Office must define the same value, that is, 1).

4 Make a test call on a trunk route that accesses the PRI being tested. Be sure the test call is to a valid destination.

5 Use LD 80 to ensure a B-channel from the NI-2 CBC pool is in use. Then:

- Place the call on hold.
- Make another call. You should receive an overflow signal (fast busy).
- Repeat this procedure for every outgoing service route.

6 Disconnect both calls.

7 Ask the terminating end to place an incoming call for each incoming call type, then:

- Place the call on hold.
- Ask the terminating end to place another call. They should receive an overflow signal (fast busy).
- Disconnect both calls.

NPI and TON in CDR

Contents

The following are the topics in this section:

Description 1489
Operating parameters 1499
Feature interactions 1500
Feature packaging 1500
Feature implementation 1500
Task summary list 1500
Feature operation 1501

Description

The Numbering Plan Identification (NPI) and Type Of Number (TON) in Call Detail Recording (CDR) feature allows NPI and TON information to be optionally displayed on the third line of CDRs. NPI and TON are associated with Calling Line Identification (CLID) information, and are useful for billing incoming calls to the originating party.

The NPI and TON are only displayed for calls on an incoming ISDN trunk. Also, the New Format CDR (FCDR) prompt must be set to NEW and the Calling Line Identification (CLID) prompt must be set to YES in Overlay 17. Figure 139 illustrates the format of the third line of a CDR ticket.

Figure 139
Third line format for CDR ticket

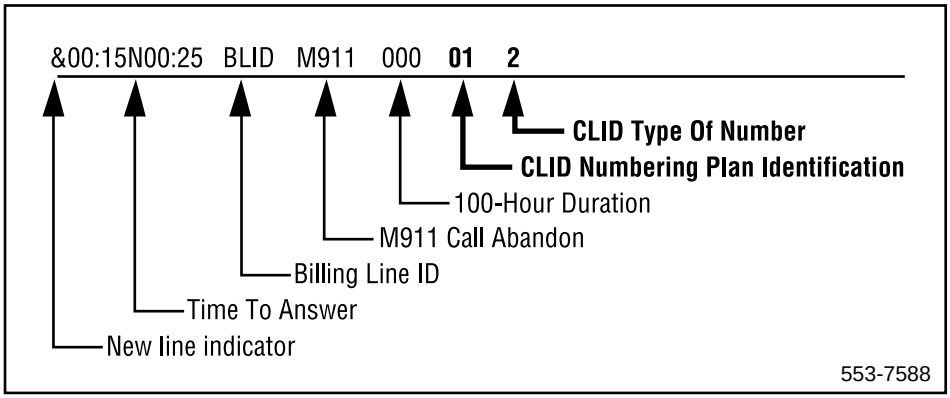


Table 110 describes the contents of the third line of CDRs.

Table 110
Third line contents of CDRs (Part 1 of 2)

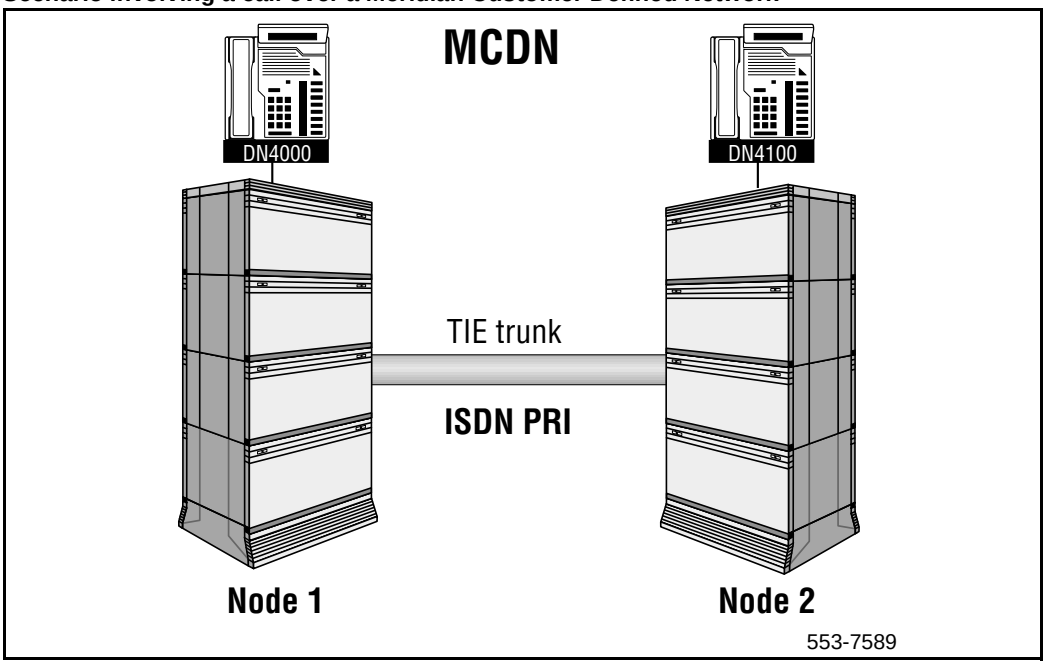
Line	Position	Field	Field Definition
3	1	blank	
3	2	&	New line indicator
3	3-7	TTA	Time To Answer (Total ringing time)
3	8	REDIR/B	Time To Answer (Redirection Indicator)/Busy Tone Identifier
3	9-13	TWT	Time To Answer (Total Waiting Time)
3	14	blank	

Table 110
Third line contents of CDRs (Part 2 of 2)

Line	Position	Field	Field Definition
3	15-30	BLID...xxx	Billing Line ID
3	31	blank	
3	32-38	ABANDON	M911 Call Abandon Tag
3	39	blank	
3	40-42	000	100-Hour Duration
3	43	blank	
3	44-45	NPI	CLID Numbering Plan Identification
3	46	blank	
3	47	TON	CLID Type Of Number
3	48	blank	

Figure 140 illustrates a scenario in which DN 4000 (on Node 1) places a call to DN 4100 (on Node 2) over a Meridian Customer Defined Network (MCDN), using a Coordinated Dialing Plan (CDP) Distant Steering Code (DSC). The call arrives at Node 2 on Route 201 Member 4. A CDR N ticket is produced when the call is disconnected.

Figure 140
Scenario involving a call over a Meridian Customer Defined Network



The CDR N ticket produced in the described scenario has the following format:

```
N 001 02 T201004 DN4100 02/10 18:07:15:00:02:24.0
 & 4000XXXXXXXXXXX
 &00:15N00:25 BLIDXXXXXXXXXXX        000 09 6
```

On line 3 of the ticket, the NPI value of “09” represents a private numbering plan. The TON value of “6” represents an Electronic Switched Network (ESN) Customer Dialing Plan (CDP). Please refer to Table 111 and Table 112 for the NPI and TON information for an MCDN incoming trunk.

When an incoming call arrives on the Meridian 1, NPI and TON are sent in the calling party Information Element (IE) and are mapped into internal values. The correspondence between the Meridian 1 values and the values given in the specifications are described in Tables 111 to 120.

Tables 111 to 120 show the information printed in the CDR ticket, depending on the incoming trunk protocol. As shown in these tables, not all combinations of NPI and TON exist.

In the TON tables, only ISDN/Telephony numbering plan (Rec. E.164/E.163) and private numbering plans are detailed. For all other supported NPI values, TON has the value of “unknown number”.

Referring to the scenario in Figure 140, Table 111 and Table 112 show the NPI and TON information for an MCDN incoming trunk.

Table 111
NPI information printed in the CDR ticket for an MCDN incoming trunk

NPI code in CDR	Corresponding value of NPI in specification
00	000 - unknown numbering plan
01	0001 - ISDN/Telephony numbering plan (Rec. E.164)
02	not used
03	not used
04	not used
08	not used
09	1001 - private numbering plan

Table 112
TON information printed in the CDR ticket for an MCDN incoming trunk

TON code in CDR	Corresponding value of TON in specification	
	NPI = ISDN/Telephony numbering plan (Rec. E.164)	NPI = private numbering plan
0	0000 - unknown number	0000 - unknown number
1	0001 - international number	not used
2	0010 - national number	not used
3	not used	0011 - ESN SPN
4	0100 - local number	not used
5	not used	0101 - ESN LOC
6	not used	0110 - ESN CDP

Table 113 and Table 114 show the NPI and TON information for a EuroISDN incoming trunk.

Table 113
NPI information printed in the CDR ticket for a EuroISDN incoming trunk

NPI code in CDR	Corresponding value of NPI in specification
00	0000 - unknown
01	0001 - ISDN/Telephony numbering plan (Rec.E.164/E.163)
02	not used
03	0011 - data numbering plan (Rec.X.121)
04	0100 - telex numbering plan (Rec.F.69)
08	1000 - national standard numbering plan
09	1001 - private numbering plan

Table 114
TON information printed in the CDR ticket for a EuroISDN incoming trunk

TON code in CDR	Corresponding value of TON in specification	
	NPI = ISDN/Telephony numbering plan (Rec. E.164)	NPI = private numbering plan
0	000 - unknown or 110 - abbreviated number	000 - unknown or 110 - abbreviated number or 001 - level 2 regional number
1	001 - international number	cannot be mapped
2	010 - national number	010 - level 1 regional number
3	011 - network specific number	011 - network specific number
4	100 - subscriber number	100 - subscriber number
5	not used	not used
6	cannot be mapped	cannot be mapped

Table 115 and Table 116 show the NPI and TON information for a QSIG incoming trunk.

Table 115
NPI information printed in the CDR ticket for a QSIG incoming trunk (Part 1 of 2)

NPI code in CDR	Corresponding value of NPI in specification
00	0000 - unknown
01	0001 - ISDN/Telephony numbering plan (Rec.E.164/E.163)
02	not used
03	0011 - data numbering plan (Rec.X.121)
04	0100 - telex numbering plan (Rec. F.69)

Table 115
NPI information printed in the CDR ticket for a QSIG incoming trunk (Part 2 of 2)

NPI code in CDR	Corresponding value of NPI in specification
08	1000 - national standard numbering plan
09	1001 - private numbering plan

Note: QSIG refers to ISO QSIG and ETSI QSIG.

Table 116
TON information printed in the CDR ticket for a QSIG incoming trunk

TON code in CDR	Corresponding value of TON in specification	
	NPI = ISDN/Telephony numbering plan (Rec. E.164)	NPI = private numbering plan
0	000 - unknown or 110 - abbreviated number	000 - unknown or 110 - abbreviated number or 001 - level 2 regional number or 101 - level3 regional number
1	001 - international number	cannot be mapped
2	010 - national number	010 - level 1 regional number
3	011 - network specific number	011 - PTN specific number
4	100 - subscriber number	100 - local number
5	not used	cannot be mapped
6	cannot be mapped	cannot be mapped

Note: QSIG refers to ISO QSIG and ETSI QSIG.

Table 117 and Table 118 show the NPI and TON information for a non-UIPE and non-MCDN incoming trunk.

Table 117
NPI information printed in the CDR ticket for a non-UIPE and non-MCDN incoming trunk

NPI code in CDR	Corresponding value of NPI in specification
00	0000 - unknown numbering plan
01	0001 - Rec. E.164
02	0010 - Rec. E.163
03	0011 - Rec. X.121
04	0100 - Telex numbering plan
08	1000 - national numbering plan
09	1001 - private numbering plan

Note: Non-UIPE refers to the 1TR6, AXE-10 for Australia and Sweden, Swissnet 2, Numeris VN4, SYS-12, and D70 connectivities.

Table 118
TON information printed in the CDR ticket for a non-UIPE and non-MCDN incoming trunk (Part 1 of 2)

TON code in CDR	Corresponding value of TON in specification	
	NPI = ISDN/Telephony numbering plan (Rec. E.164)	NPI = private numbering plan
0	0000 - unknown number[1]	0000 - unknown number[1]
1	0001 - international number[2]	not used
2	0010 - national number[2]	not used
3	not used	0011 - network specific number[2]
4	0100 - subscriber number[2]	not used

Table 118
TON information printed in the CDR ticket for a non-UIPE and non-MCDN incoming trunk (Part 2 of 2)

TON code in CDR	Corresponding value of TON in specification	
	NPI = ISDN/Telephony numbering plan (Rec. E.164)	NPI = private numbering plan
5	not used	not used
6	not used	0110 - abbreviated number[2]
1. For SYS-12, AXE-10 for Australia and Sweden, Swissnet, Numeris VN4, and D70 interfaces, all received values are mapped into unknown code.		
2. For all interfaces not mentioned in 1.		

Table 119 and Table 120 show the NPI and TON information for an NI-2 incoming trunk.

Table 119
NPI information printed in the CDR ticket for an NI-2 incoming trunk

NPI code in CDR	Corresponding value of NPI in specification
00	0000 - unknown numbering plan
01	0001 - ISDN/Telephony numbering plan (Rec. E.164)
02	unused
03	unused
04	unused
08	unused
09	1001 - private numbering plan

Table 120
TON information printed in the CDR ticket for an NI-2 incoming trunk

TON code in CDR	Corresponding value of TON in specification	
	NPI = ISDN/Telephony numbering plan (Rec. E.164)	NPI = private numbering plan
0	not used	not used
1	001 - international number	not used
2	010 - national number	not used
3	not used	not used
4	100 - local number	100 - subscriber number
5	not used	not used
6	not used	not used

Operating parameters

The NPI and TON in CDR feature applies only for incoming ISDN trunk calls. NPI and TON information depends on the incoming trunk protocol.

The NPI and TON fields are left blank for internal calls, outgoing trunks, incoming non-ISDN trunks, or if the CLID prompt is set to NO.

When the FCDR prompt is set to OLD, the NPI and TON fields do not exist, regardless of how the CLID prompt is defined.

NPI and TON information is available with the following incoming interfaces: EuroISDN, QSIG (ISO and ETSI), MCDN, non-UIPE and non-MCDN, and NI2.

NPI and TON information is included in all types of CDR records that contain CLID information.

NPI and TON information is lost when system initialization occurs and the call is then reconstructed. In this case, if the call involves an incoming ISDN trunk and if the NPI and TON in CDR feature is configured, the NPI field contains two zeros (00) and the TON field contains one zero (0), regardless of the NPI and TON sent at call setup.

Feature interactions

The NPI and TON in CDR feature does not have any specific interactions with other features.

Feature packaging

The NPI and TON in CDR feature requires the following packages:

- Call Detail Recording (CDR) package 4
- Call Detail Recording on Teletype Machine (CTY) package 5
- Calling Line Identification in Call Detail Recording (CCDR) package 118
- New Format Call Detail Recording (FCDR) package 234

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 17 – Configure the NPI and TON fields.

LD 17 – Configure the NPI and TON fields.

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	PARM	System parameters.
...		
FCDR	NEW	New Format CDR. OLD = Old CDR format (default).
...		

CLID ...	YES	TON and NPI fields, in addition to CLID, are included.

Note 1: For the NPI and TON in CDR feature, existing CDR implementation procedures must be performed.

Note 2: CLID must be configured for the NPI and TON in CDR feature. Refer to the “Calling Line Identification” and “ISDN Calling Line Identification Enhancements” feature modules in this document.

Feature operation

No specific operating procedures are required to use this feature.

Private to Public CLID Conversion

Contents

The following are the topics in this section:

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Description 1503
Uniform Dialing Plan (UDP) 1508
Coordinated Dialing Plan 1512
Operating parameters 1517
Feature interactions 1518
Networking feature interactions 1520
Feature packaging 1521
Feature implementation 1522
Task summary list 1522
Feature operation 1524

Regional material statement

The information presented in this section does not pertain to all market regions. Contact your system supplier or your Nortel Networks representative to verify support of this product in your area.

Description

The Private to Public Calling Line Identification (CLID) Conversion feature permits the correct CLID to be sent to the CO when a call hops off the private network to the public network (the PSTN) at a tandem node.

On ISDN trunks, Calling Line Identification (CLID) information is sent in the Calling Party Information Element (IE) of the setup message. This information is used to display the originating party's number on the terminating telephone. A Call Type indicator is also present, to indicate to the switch at the other end what type of call it is receiving (International, National, Subscriber, UDP, CDP, SPN). This in turn affects how that switch handles the call using the INAC prompt.

Originating nodes configure the format of the CLID using the following components:

- the dialing plan used to make the call
- the type of trunk used for the call
- the Customer Data Block option and Class of Service of the telephone related to sending the Prime DN (PDN) or Listed Directory Number (LDN) of the telephone

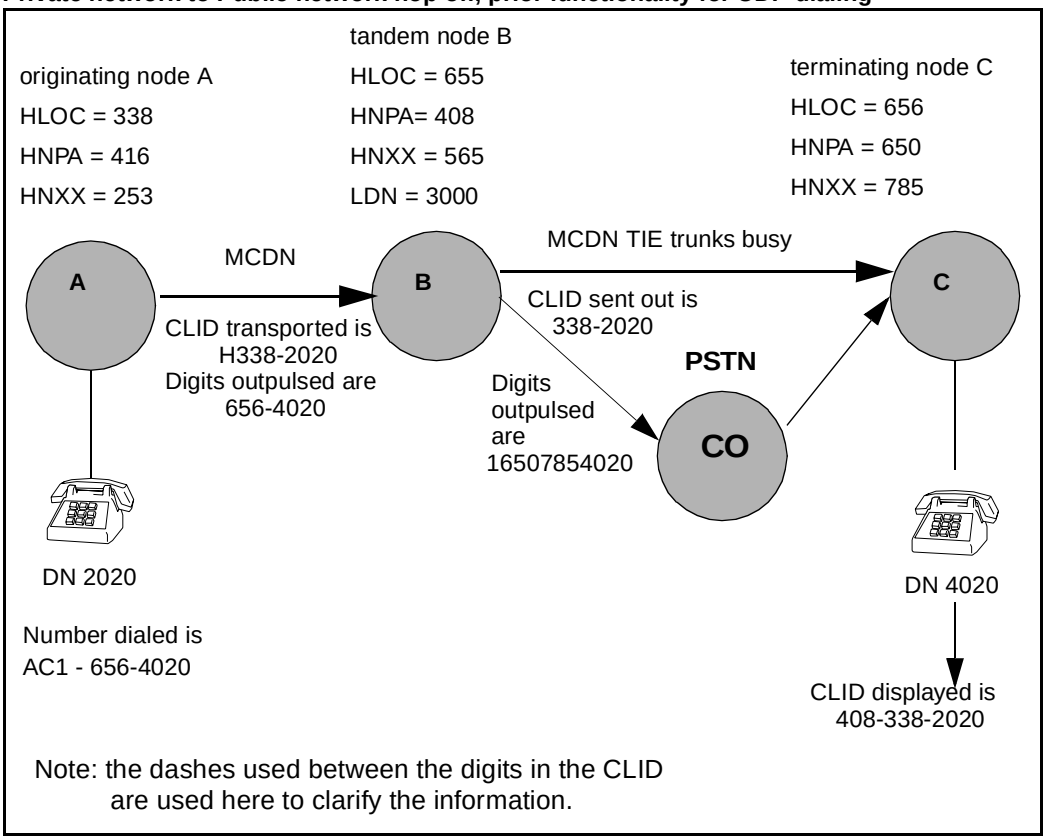
For example, a call dialed with a Location Code (private Uniform Dialing Plan), that is sent out on a private network trunk (TIE trunk) has a CLID in the private network format (LOC+DN). However, a Location Code call that is sent out on a public network trunk (a COT trunk, for example) has a CLID in the public network format [National (NPA+NXX+DN)]. The public network number can be the LDN of the customer group for non-DID telephones or the NPA+NXX+DN for DID users.

If the default method for constructing Call Types is not suitable, the administrator can program Digit Manipulation Indexes to apply to calls as they leave the switch to change the Call Type indicator that travels with each call.

Prior to this feature introduction, a tandem node that received CLIDs from another node on an ISDN TIE trunk passed the CLIDs along without changing them. A Meridian 1 acting as a tandem node did not convert a private format CLID to a public format CLID when routing a call on a PSTN trunk. The private format CLID of the originating telephone was sent to the Central Office (CO). However, there are COs in North America that modify the CLID (adding an NPA and NXX) when less than ten digits are received. If the Meridian 1 sends seven digits in the CLID to the PSTN, the CO automatically inserts the NPA *of the serving area*. Therefore, the CLID ends up as: NPA+LOC+DN. Therefore, the terminating telephone displayed a CLID that was sometimes a valid telephone number in the area around the tandem node but it was not the correct CLID of the originating user.

The scenario described above is illustrated in Figure 141 on page 1506.

Figure 141
Private network to Public network hop off, prior functionality for UDP dialing



In the example in Figure 141, the calling party dialed a private number in the UDP format: LOC+DN (656-4020). The originator's DN is 2020 and the LOC is 338. If the call is routed all the way through the private network, the user on DN 4020 sees H3382020 on the display. (The terminating node inserts the letter H in front of the CLID digits to indicate that the call originated from the private network.)

If the call encounters “all trunks busy” on the TIE trunks to switch C at the tandem node, switch B is programmed to alternately route the call out to the CO. The calling number digits (3382020) are sent to the CO. The CO sees seven digits and, if ten digits is a requirement, inserts the NPA of the serving area around the tandem node, (408 in this example). When the call reaches the destination, the display reads 4083382020. This CLID is not the correct number for the originator. However, it is possible that the number is valid for a subscriber in the 408 area code. When the terminating party attempts to use the CLID for callback purposes, it can result in a call to someone in the 408 area code who did not originate the earlier call.

The Private to Public Calling Line Identification (CLID) Conversion feature is applicable to Electronic Switched Networks (ESNs) that use the following private network numbering plans and codes:

- Uniform Dialing Plan (UDP) and Location Codes (LOCs)
- Coordinated Dialing Plan (CDP) and Distant Steering Codes (DSCs)

A private format CLID can be in either of the following formats:

- LOC+DN
- DSC+X..X

The Private to Public CLID Conversion feature provides two different options to send a public format CLID to the PSTN. The options are:

- **CLID contains the NPA and NXX of the originating node.** For outgoing calls from the tandem node you translate location codes (LOC) and/or Distant Steering Codes (DSC). For incoming calls from those switches and CLID conversion purposes, you program the NPA and NXX of each originating node to associate with its LOC or DSC at the tandem node. The tandem node uses this NPA and NXX to build a public format CLID for the originator when calls from that switch hop off to the public network from the tandem node.
- **CLID contains the LDN of the tandem node.** You can use the LDN of the tandem node for the public format CLID.

This feature introduces a prompt (CPUB) in the Route Data Block (LD 16). This prompt controls what option applies when the tandem node builds the public format CLID. Program the CPUB option on the outgoing PSTN routes. The CPUB options are:

- ON
- OFF
- LDN

ON means the feature is enabled. The system uses the NPA and NXX programmed for the LOC or DSC of the caller to build the CLID.

OFF means the feature is disabled. The CLID is built as it was prior to the introduction of this feature.

LDN The tandem node sends its LDN0 (from LD 15) to the CO as the CLID. The CLID is constructed by coupling the HNPA and HNXX in CLID entry 0 in the Customer Data Block (LD 15) with the LDN0 from LD 15 at the tandem node.

Uniform Dialing Plan (UDP)

In LD 90 you program an NPA and NXX (to be used for CLIDs) for each LOC you translate.

Figure 142 on page 1510 illustrates the effect of the conversion capability when a user dials a private network call in the UDP format and the tandem node is programmed to send the CLID of the originator.

Figure 143 on page 1511 illustrates the effect of the conversion capability when a user dials a private network call in the UDP format and the tandem node is programmed to send its LDN as the CLID.

Before sending the call to the CO, the Meridian 1 software checks the Route Data Block for the PSTN route. It checks the CPUB option and one of the following results can occur:

- if it is “OFF”, no manipulation of the digits occurs. The Private CLID is sent to the CO. Figure 141 on page 1506 illustrates what happens when CPUB is OFF.

- if it is “ON” the software checks the CLID within the Calling Party IE of the outgoing setup message. Use Figure 142 on page 1510 as an example. The software detects the leading digits (338) and checks LD 90 for translation of LOC 338. If it is in the translation tables, the software checks for NPA and NXX entries for that location code. If these entries are there, the LOC 338 is replaced by the NPA and NXX. The changed CLID number is sent to the CO. In this example, 3382020 is replaced by 4162532020. This is a number which the terminating user can dial to reach the originator.
- if it is “LDN”, the listed directory number of the tandem Meridian 1 is sent. The LDN0 of the tandem node is paired with the HNPA and HNXX associated with CLID entry 0 in LD 15 to build the CLID that is sent to the CO. Refer to Figure 143 on page 1511.

Figure 142
Private network to Public network hopoff, NPA and NXX conversion functionality for UDP dialing

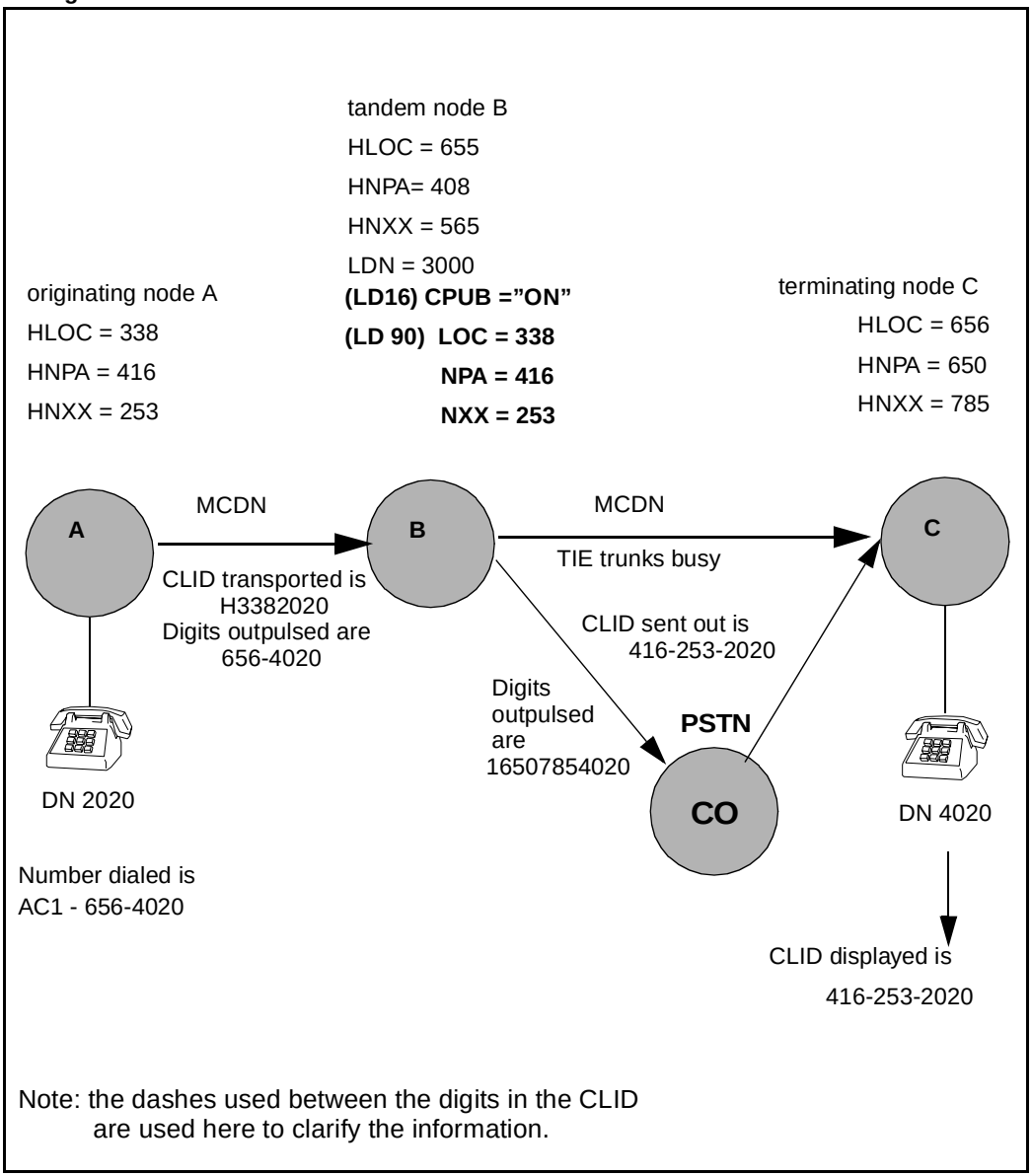
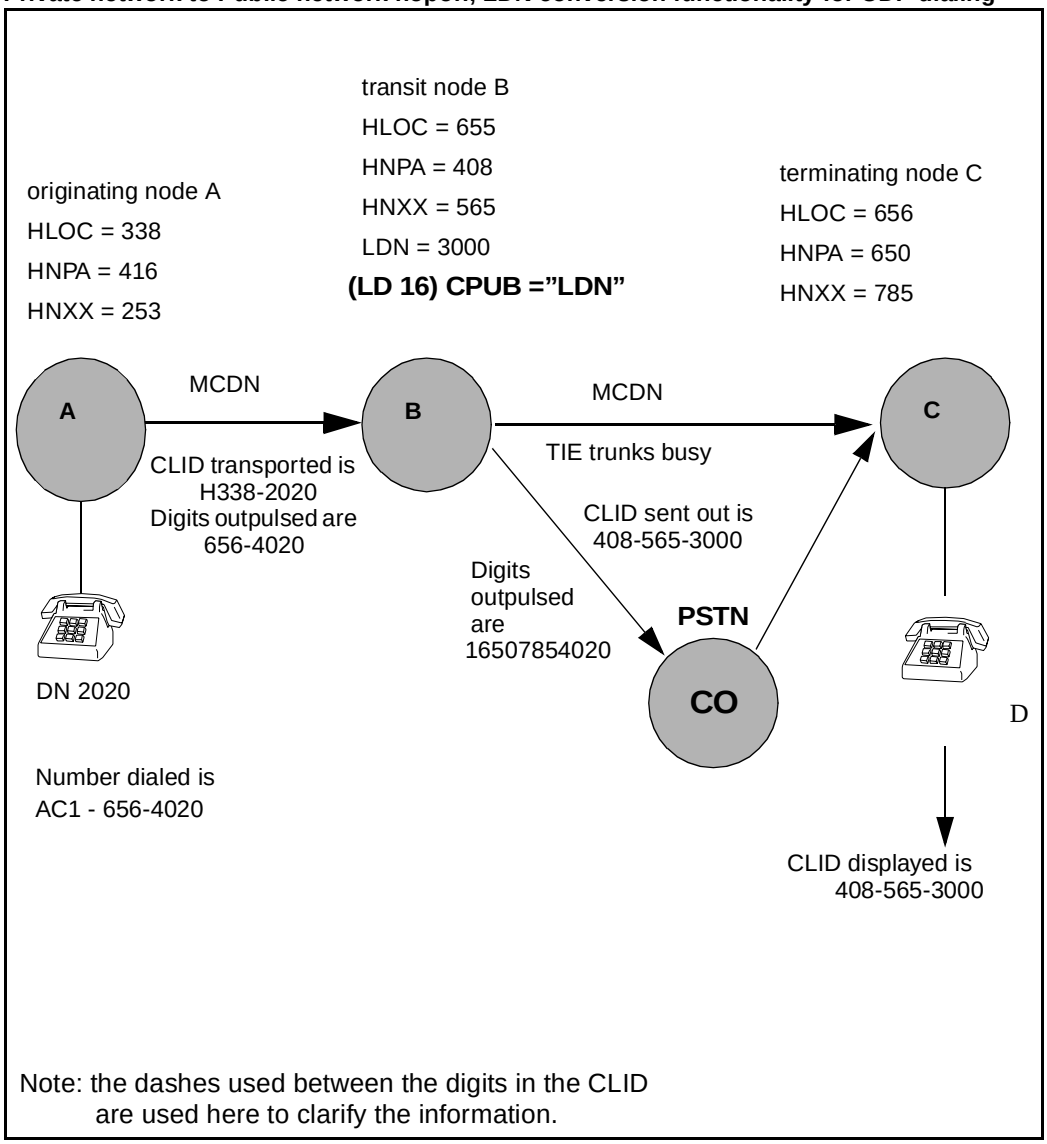


Figure 143
Private network to Public network hopoff, LDN conversion functionality for UDP dialing



Note: the dashes used between the digits in the CLID are used here to clarify the information.

Coordinated Dialing Plan

In LD 87, at a tandem node, you program an NPA and NXX for each Distant Steering Code (DSC) you translate. The system uses this information to build public format CLIDs.

In the examples that follow, the calling party (DN 2020) dials a private network number (4020). The tandem node translates this number as a DSC (4) followed by the digits 020.

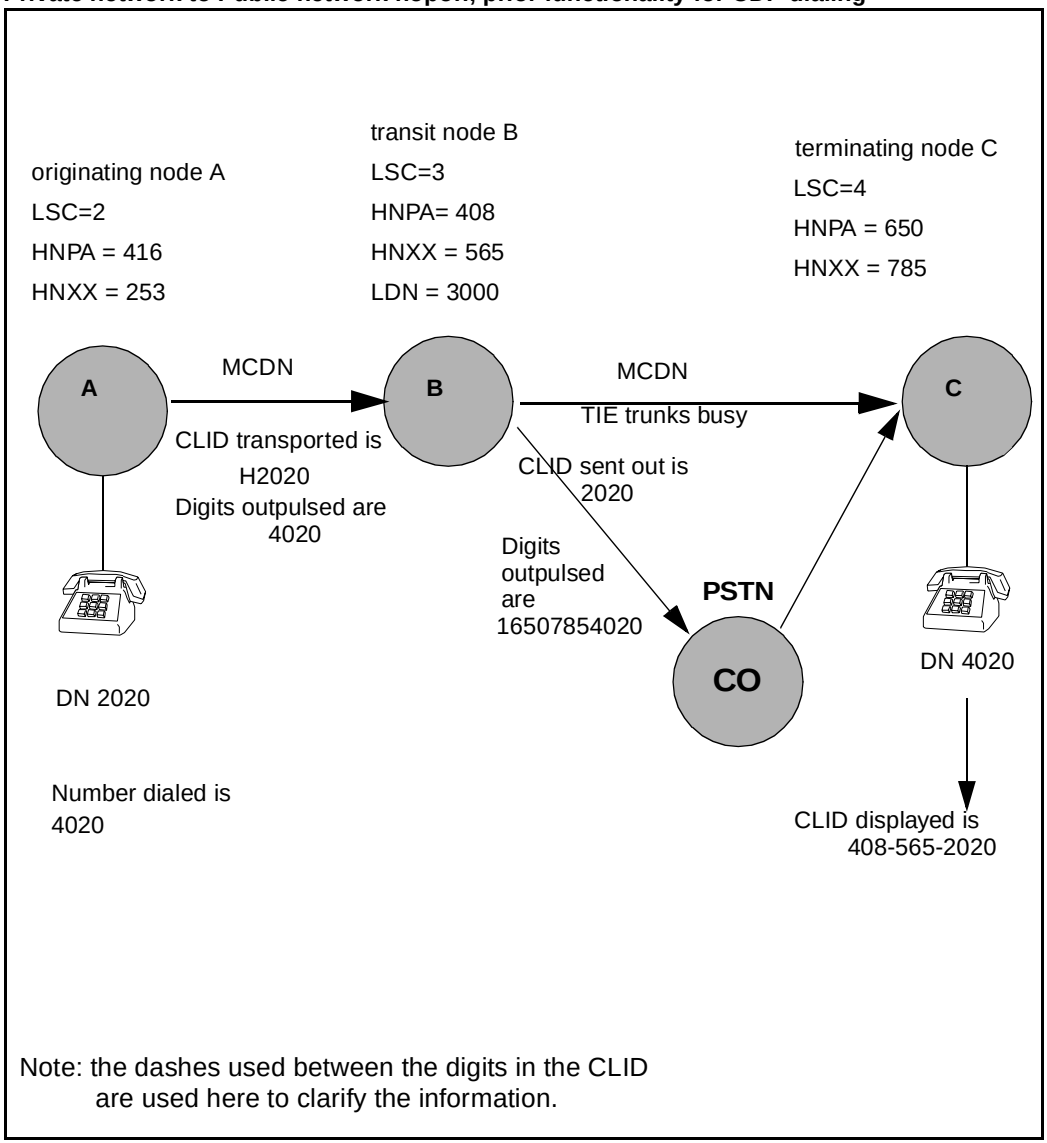
If the switches can use the private network for the call, the user on DN 4020 sees CLID H2020 on the display.

If the TIE trunks at the tandem node to the destination node are all busy, the tandem node can send the call out to the CO. With the conversion feature turned off, the CLID sent to the CO is 2020.

In the figures that follow, the tandem node is in area code (NPA) 408 and has an exchange code (NXX) of 565. If the CO requires ten-digit CLIDs, it inserts 408 and 565 as leading digits in the CLID. When the call reaches the destination, the display reads 4085652020. It is possible that this number is a valid number for a subscriber in area code 408. The user at the terminating telephone cannot use this number to place a call to the originator of the call.

Figure 144 on page 1513 shows you how a tandem node and a CO build a CLID when a Meridian 1 with CDP does not have the Private to Public CLID Conversion feature.

Figure 144
Private network to Public network hopoff, prior functionality for CDP dialing



Note: the dashes used between the digits in the CLID are used here to clarify the information.

Figure 145 on page 1515 illustrates the effect of the conversion capability when a user dials a private network call in the CDP format and the tandem node is programmed to send the CLID of the originator.

Figure 146 on page 1516 illustrates the effect of the conversion capability when a user dials a private network call in the CDP format and the tandem node is programmed to send its LDN as the CLID.

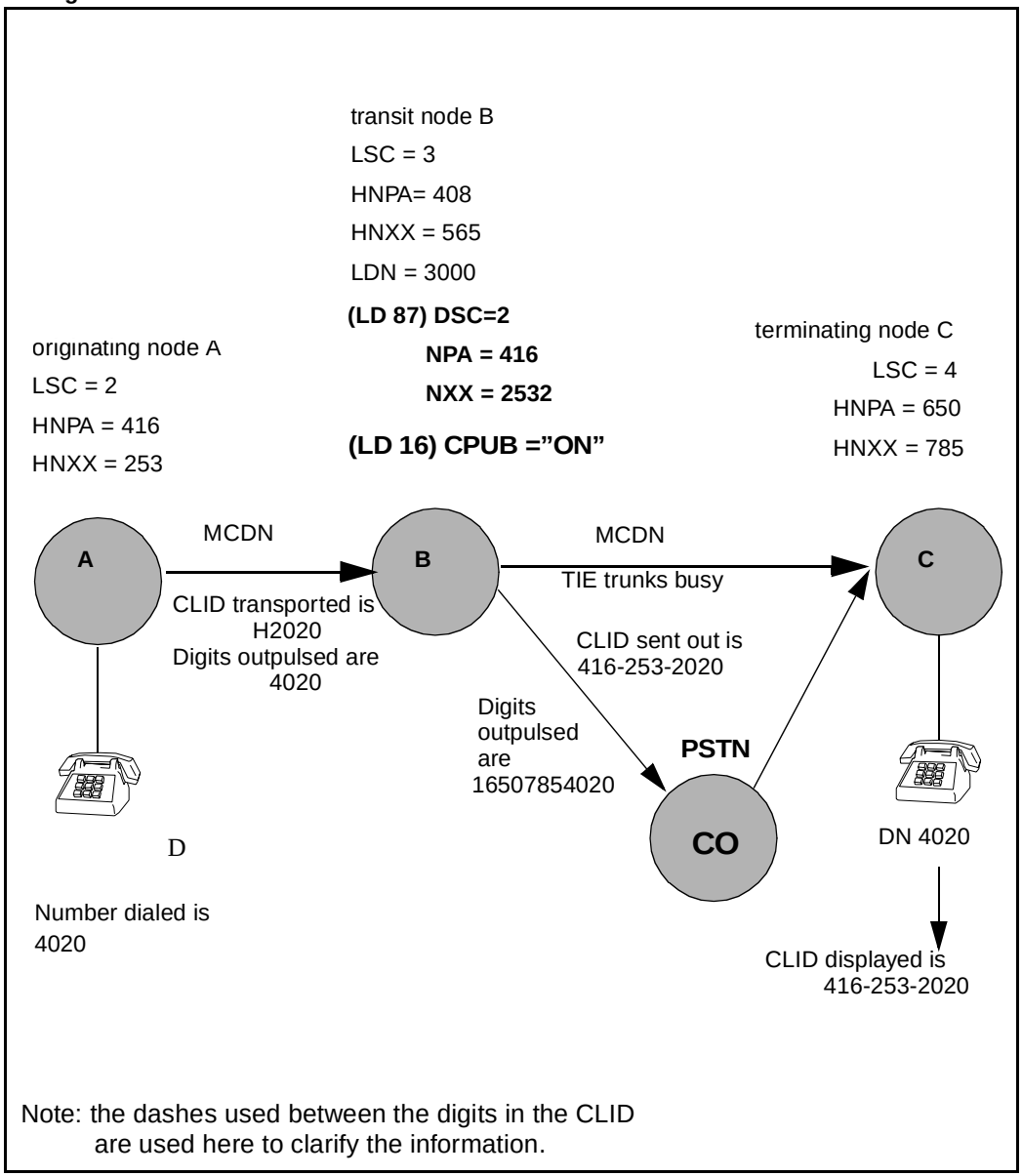
Before sending the call to the CO, the Meridian 1 software checks the Route Data Block for the PSTN route. It checks the CPUB option and one of the following results can occur:

— if it is “OFF”, no manipulation of the CLID digits occurs. The tandem node sends the Private CLID to the CO. Figure 144 shows you the CLID format when the CPUB option is OFF.

— if it is “ON” the software checks the CLID within the Calling Party IE of the outgoing setup message. Use Figure 145 on page 1515 as an example. The software detects the leading digits (2020). The system checks for a DSC translation entry in LD 87 equal to 2, 20, 202, or 2020. (It uses the left-wise unique rule.) If there is an entry for the DSC, the software checks for NPA and NXX entries for that Steering Code. The node adds the NPA and NXX as leading digits in the CLID. The software automatically deletes the DSC from the CLID. You must include the removed DSC at the end of the NXX field to maintain the accuracy of the CLID. The node sends the changed CLID to the CO. In this example, 4162532020 replaces 2020. The terminating user can dial this number to reach the originator.

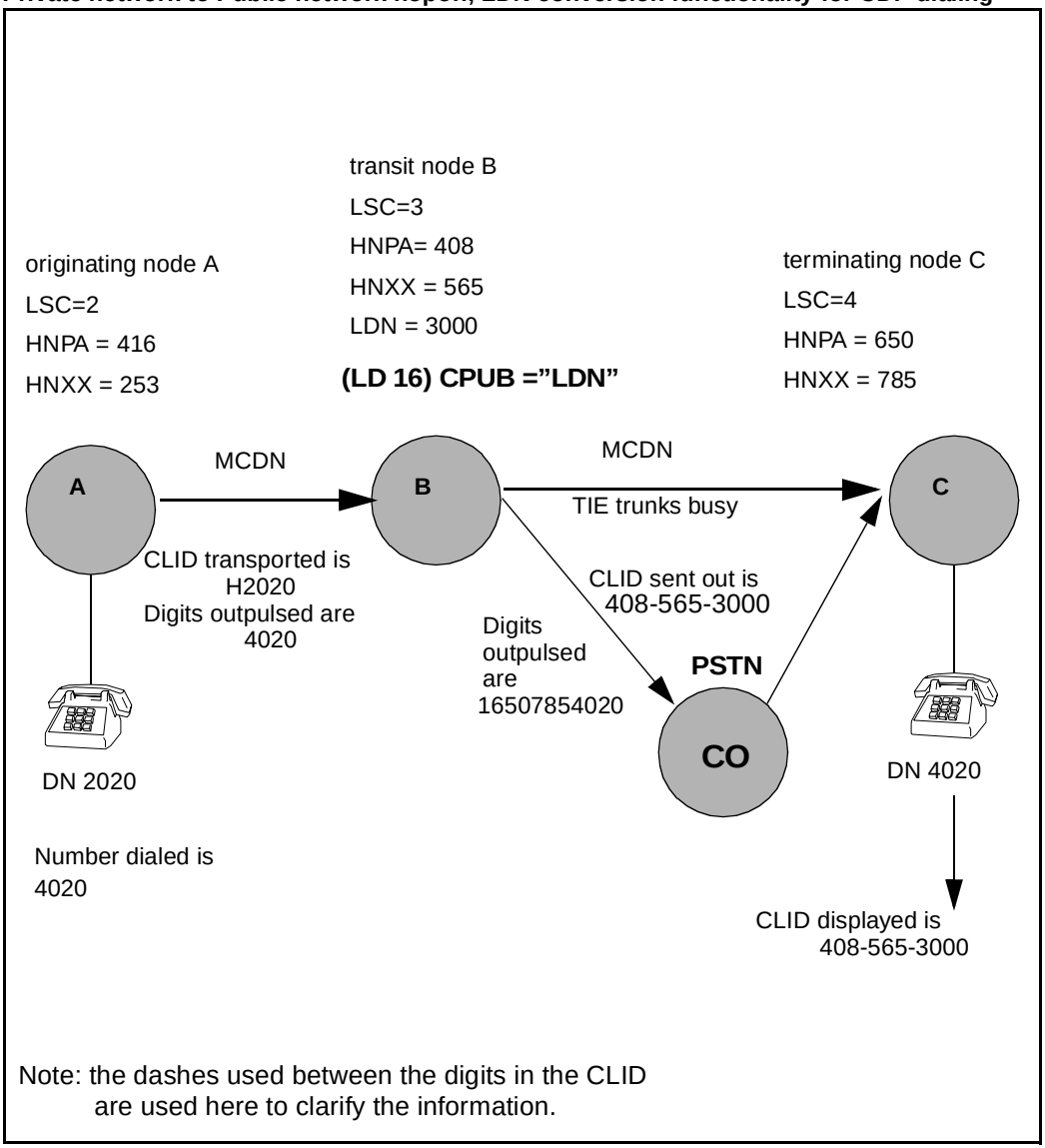
— if it is “LDN”, the node sends its listed directory number as a CLID to the CO. The node attaches the HNTN and HLCL from CLID entry 0 in LD 15 to the LDN0 in LD 15. It sends this CLID to the CO.

Figure 145
Private network to Public network hopoff, NPA and NXX conversion functionality for CDP dialing



Note: the dashes used between the digits in the CLID are used here to clarify the information.

Figure 146
Private network to Public network hopoff, LDN conversion functionality for CDP dialing



Operating parameters

You can use the feature with the following types of ISDN interfaces at the tandem node:

— DMS 100

— DMS 250

— #4 ESS

— #5 ESS

— SL-100

— NI-2 TR-1268

The conversion of the CLID also occurs when features such as Call Forward All Calls, Forward No Answer, and Hunting divert calls to the public network.

Some COs use the CLID to perform billing. When a Meridian 1 tandem node interfaces with one of these COs, set the CPUB option to “LDN” to allow correct billing. Or else, with the CPUB option on, the CO uses the originator’s CLID for billing purposes. The call used the private network part of the way; the bill for the call is not correct when it is based on this CLID. If you use the Incoming Trunk Programmable Calling Line ID feature, it takes priority over the Private to Public CLID conversion feature (refer to *Feature interactions*).

The software does not validate the NPA and NXX you input for each LOC and DSC. When you test the operation of this feature, check the CLID shown on the display of the terminating telephone. Make sure it is the call originator’s CLID.

When used with CDP, the software automatically deletes the DSC from the CLID. You must include the removed DSC at the end of the NXX field to maintain the accuracy of the CLID. For example, if the DSC is 32 and the NXX is 658, program the NXX as 65832 in order to construct the correct CLID.

To activate the feature you must enable it in LD 16 on the outgoing PSTN route. You must also program an NPA and NXX for each LOC in LD 90 or each DSC in LD 87. If you do not program an NPA and NXX in LD 90 or LD 87, the system cannot build the public format CLID.

The feature does not work if CPUB = LDN but there is no LDN0 or CLID entry 0 in LD 15.

The tandem node must receive the CLID in the LOC+DN or DSC+X..X format for the feature to operate.

This feature addresses only private to public CLID conversion and not public to private CLID conversion.

The Private to Public CLID Conversion feature provides one NPA and one NXX for each LOC or DSC. To support networks with switches that have more than one NPA or NXX, assign one LOC or DSC for each NPA or NXX.

The feature does not operate if the originating CLID contains a DSC or LOC that the tandem node cannot translate. (One reason not to translate an LOC or DSC is to block outgoing calls to that destination from the tandem node.) Solution: Add the code(s) to the translation tables at the tandem node so it can convert incoming CLIDs to the correct public network format. Block outgoing calls from the tandem node to the destination with other forms of restriction. [For example, you can use Supplemental Digit Restriction (in LD 90) or Facility Restriction Levels (in LD 86)].

This feature only operates on the CLID and not on other information elements such as the redirecting number, the connected name, or the connected number.

The tandem node has limitations when it handles calls from an originating switch that has both DID and non-DID DNs. The tandem node converts all CLIDs from a switch with one LOC the same way. You can program the tandem node to send its LDN for non-DID DNs at the originating switch, if these DNs are associated with a different LOC than the DID DNs.

Feature interactions

Automatic Call Distribution (ACD)

When a private call is presented to an ACD DN, and the call flows to the PSTN due to the ACD Night Call Forward or the Interflow or the Overflow feature, the Private to Public CLID Conversion feature operates.

Alternate Routing

The Private to Public CLID Conversion feature applies to calls which are alternately routed by one of the following features: Network Alternate Routing (NARS), QSIG Alternate Routing, and MCDN Alternate Routing.

Call Redirection (External Calls)/Hunting

Call Redirection includes the following redirections at the tandem node:

- Call Forward All Calls
- Call Forward Busy
- Call Forward by Call Type
- Call Forward External Deny
- Call Forward No Answer / Flexible Call Forward No Answer
- Call Forward No Answer, Second Level
- Call Redirection by Time of Day
- Call Redirection by Day

When a call forwards to an external telephone, and if the call is sent out on a PSTN route, then the Private to Public Conversion feature configures a public format CLID, if the option is configured at the node that is redirecting the call. The same applies to Hunting, if the Hunt DN is an external number.

Call Transfer

The Private to Public Conversion feature has no interaction with Call Transfer. The prior functionality continues.

Calling Party Privacy (CPP) and Calling Party Privacy Override (CPPO)

A call marked as a CPP or CPPO call can hopoff the private network to the public network. Even though the Private to Public Conversion feature modifies the private CLID to a public format CLID, the presentation indicators indicating whether this is CPP/CPPO call are not modified. After hopoff occurs, the call continues to be identified as a CPP or CPPO call.

Call Detail Recording (CDR)

This feature has no interaction with CDR. After the CLID is converted, the information in the call record is the same as it was with no conversion.

Incoming Trunk Programmable Calling Line ID

The Incoming Trunk Programmable Calling Line ID feature allows you to program a CLID (or billing number) on an incoming route. This feature takes precedence over the Private to Public CLID Conversion feature when they are both programmed at the tandem node.

Meridian Mail

In a case where a call terminates on Meridian Mail with a converted CLID, the private greeting is not given. Either an unknown origin or public greeting is given.

Call Sender feature

This feature has no interaction with the Call Sender feature of Meridian Mail. If a public format, converted CLID is received and the Call Sender feature is configured in Meridian Mail, the user can use Call Sender to callback the caller.

Remote Virtual Queuing

Remote Virtual Queuing continues to work normally. During a call reinitiation (when a public network trunk becomes available), if a hopoff to the public network takes place, this feature converts the originating CLID to a public format.

Networking feature interactions

CLID Enhancements

The CLID Enhancements feature provides flexibility in the way the CLID at the *originating* node is built. The Private to Public Conversion feature works at the *tandem* node, and does not have any interaction with the CLID Enhancements feature. If the tandem node is configured to send the LDN of as the CLID, CLID entry ‘0” from LD 15 is used to build the tandem node LDN CLID.

Network ACD

When Network ACD routes a call over a PSTN route, the Private to Public CLID Conversion feature builds a public format CLID, if this option is configured at the node that diverted the call.

Network Ring Again

The Network Ring Again feature continues to work normally. During a call reinitiation, if a hopoff to the public network takes place, this feature converts the originating CLID to a public format.

Internet Telephony Gateway (ITG)

ITG 2.0 implements ITG with ISDN as ITG ISL. When an ITG ISL trunk call hops off to the public network, the system builds a public network format CLID, if this feature is configured.

Feature packaging

The following software packages are required:

- Network Alternate Route Selection (NARS) package 58 (and Basic Automatic Route Selection (BARS) package 57 - optional) and/or Coordinated Dialing Plan (CDP) package 59
- Integrated Services Digital Network (ISDN) package 145
- Primary Rate Access (PRA) package 146 or 2.0 Mb Primary Rate Interface (PRI2) package 154

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 16 – Configure the PSTN route for Private to Public CLID Conversion.

2 LD 87 – Configure the NPA and NXX associated with each DSC.

3 LD 90 – Configure the NPA and NXX associated with each LOC.

LD 16 – Configure the PSTN route for Private to Public CLID Conversion.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	RDB	Route Data Block.
CUST	xx	Customer Group number.
...	...	
ROUT	xx	Trunk Route number.
...	...	
ISDN	YES	Integrated Services Digital Network option.
- IFC	a..a	Interface type for route. IFC must be one of the following for the CPUB prompt to appear: S100, D100, D250, ESS4, ESS5, NI2.
...	...	
CPFXS	(YES) NO	Customer-defined prefixes.
CPUB	 (OFF) ON LDN	Conversion to public number feature. No conversion; CLID remains in private number format. Send the NPA and NXX associated with LOC (in LD 90) or DSC (in LD 87). Send the LDN of this node.
...	...	

LD 87 – Configure the NPA and NXX associated with each DSC.

Prompt	Response	Description
REQ	NEW	New.
	CHG	Change.
CUST	xx	Customer Group number.
FEAT	CDP	Coordinated Dialing Plan.
TYPE	DSC	Distant Steering Code.
DSC	x..x	Distant Steering Code digits.
- RLI	xxx	Route List Index (used for outgoing calls).
...	...	
-- NPA	x..x	NPA to be inserted in the outgoing public format CLID when this DSC is received in the CLID of an incoming call (maximum seven digits).
-- NXX	x..x	NXX to be inserted in the outgoing public format CLID when this DSC is received in the CLID of an incoming call (maximum seven digits).
...	...	

LD 90 – Configure the NPA and NXX associated with each LOC.

Prompt	Response	Description
REQ	NEW	New.
	CHG	Change.
CUST	xx	Customer group number.
FEAT	NET	Network Translation.
TRAN	AC1	Access code 1 translation table.
	AC2	Access code 2 translation table.
TYPE	LOC	Location code.

LOC	x..x	Location code digits (maximum seven digits).
- RLI	xxx	Route List Index (used for outgoing calls).
-- NPA	x..x	NPA to be inserted in the outgoing public format CLID when this LOC is received in the CLID of an incoming call (maximum seven digits).
-- NXX	x..x	NXX to be inserted in the outgoing public format CLID when this LOC is received in the CLID of an incoming call (maximum seven digits).
...	...	

Feature operation

There are no operating procedures specified for this feature.

Radio Paging Improvement

Contents

The following are the topics in this section:

Description 1525
Operating parameters 1526
Feature interactions 1526
Feature packaging 1528
Feature implementation 1528
Task summary list 1528
Feature operation 1529

Description

A Radio Paging system is a communications tool used to contact mobile parties by means of radio signals. A caller can use their telephone set to page a mobile party who has a mobile portable receiving device.

Prior to the improvement, the Radio Paging (RPA) feature supported attendant recall in stand-alone operation only. The RPA recalls to the local attendant on the node where the RPA system is directly connected.

This product improvement enables RPA to recall the attendant who originated the Radio Paging call only; the attendant may be located anywhere within an ISDN Meridian Customer Defined Network (MCDN) configured with Network Attendant Services (NAS).

The improvement also enables the upgrade to the attendant's display with paged name to display paged name instead of answering name on the paging party when answered. It also allows Network Radio Paging to show the same display information as in the stand-alone operation.

Operating parameters

For Pre-selection Paging, if the paged DN, following the RPAX FFC, is not local to the paging node, the Call Party Name Display (CPND) name for this DN cannot be obtained to be displayed on the calling party's terminal. If the paged DN is local on the paging node and has CPND defined, the CPND can be retrieved and sent to the calling party for display purposes. For Post-selection Paging, the CPND of the paged DN will be displayed even if the DN is not local to the paging node.

If a network call comes in to a set on the paging node and is redirected to paging by CFNA, the calling name cannot be retrieved and updated on the answering set when the paging call is answered. This happens only if the set on the paging node has CPND defined. If the set does not have CPND defined, the calling name can be updated on the answering party's set.

Feature interactions

Call Detail Recording Enhancement

With this enhancement to CDR, an "S" record is printed when an attendant extends an outgoing trunk call to a destination party. When the extended outgoing trunk call or the destination party releases to disconnect, an "E" record is printed. Prior to this enhancement, no CDR record was printed until the extended outgoing trunk call or the destination party released, when an "N" record was printed. This CDR enhancement also applies with network Radio Paging.

When an attendant makes an outgoing call (established on the source side) and then extends the call to remote radio paging on another node by using a normal trunk (e.g. Trunk Pxxx), an "S" record is printed when the attendant releases to extend the call to network RPA.

If the outgoing trunk call releases before the paged call is answered, the "E" record will show the normal trunk ID (TrunkPxxx).

If the paged call has been answered when the outgoing trunk call releases, the "E" record will show the paged DN instead of Trunk Pxxx.

For more information, please refer to the CDR Enhancement module contained in this document.

Display of Calling Party Denied

If the DNPD package is ON (packaged under the International Supplementary features package), additional Classes of Service can be assigned to sets that determine whether or not their DN and CPND information will be displayed on other sets. No CPND or DN information is displayed on sets involved in a network RPA call that have name display denied or digit display denied Class of Service.

Slow Answer Recall Modification (SLAM)

With the Slow Answer Recall Modification feature enabled, when the attendant answers a recall, the destination party is disconnected. This also applies to Radio Paging.

When the attendant answers a paging recall, the call is removed from the meet-me queue and the recall cannot be answered by the paging party by using RPA Answer. The paging party is put on the source side of the attendant; there is nothing connected on the destination side. The attendant cannot extend the call to paging by pressing the Release key. Pressing the Release key will disconnect the paging party from the source side and the attendant will become idle.

The attendant can extend the call to Radio Paging again by either: dialing the RPAX FFC + the DN (preselection); or dialing the DN, and while the DN is ringing or busy, pressing the RPAG key (post-selection).

Network Attendant Services (NAS)

NAS configuration is a requirement for the Network Radio Paging (NRPA) Recall to Same Attendant (RTSA) feature. Without NAS, NRPA RTSA is not active, and the existing operation will be followed.

With NAS configured, if an RPA recall to the attendant on the originating node is not allowed, the recall will be presented on the paging node. Existing operation prior to this development is performed. There is no new interaction introduced with NAS features.

Feature packaging

The following package is required for Radio Paging Improvement:

- Radio Paging (RPA) package 187.

The following packages are also required:

- To gain access to RPA, Flexible Feature Codes (FFC) package 139;
- For the Radio Paging Network Recall operation, Network Attendant Service (NAS) package 159
- For Remote Radio Paging, Coordinated Dialing Plan (CDP) package 59 is required to define RPA FFCs as Distant Steering Codes (DSCs) or Trunk Steering Codes (TSCs);
- To display characters instead of the Radio Paging Flexible Feature Code, Calling Party Name Display (CPND) package 95; and
- Integrated Services Digital Network (ISDN) package 145 and its dependencies for operation in an MCDN ISDN network.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 15 – In order for the this feature to operate network -wide, the Recall to Same Attendant (RTSA) prompt must be activated on the originating node as follows:

2 LD 87 – Set up remote Radio Paging on originating node.

LD 15 – In order for the this feature to operate network -wide, the Recall to Same Attendant (RTSA) prompt must be activated on the originating node as follows:

Prompt	Response	Description
REQ:	NEW CHG	New, or change.
TYPE:	ATT	Attendant Consoles data.
CUST	xx	Customer number.
- OPT	aaa	Options.
...		
RTSA	RSAA	Recall to Same Attendant Allowed.

LD 87 – Set up remote Radio Paging on originating node.

Prompt	Response	Description
REQ	NEW CHG	New, or change.
TYPE	TSC DSC	Trunk Steering Code Distant Steering Code (enter RPAX FFC defined on paging node).
RRPA	(NO) YES	Remote Radio Paging option.
RLI		Route List Index of Route List Block used to route to paging node.

Feature operation

There are no operating procedures specified for this feature.

Radio Paging Product Improvement Continuation

A Radio Paging System (RPS) is a communications tool used to contact mobile parties by means of radio signals. With this system, a set can page a mobile party that is equipped with a radio paging device. The Radio Paging Product Improvement Continuation enhances the performance of the Radio Paging feature by providing the following:

- an increase in the number of digits sent to and displayed on a Radio Paging device
- the ability to activate/deactivate Pretranslation for Radio Paging calls
- five internal/external call treatments to a pager installed in the paging rack

For complete information regarding this feature, refer to the *Features and Services* (553-3001-306) guide.

Recall with Priority during Night Service Network Wide

Contents

The following are the topics in this section:

Description 1533
Operating parameters 1534
Feature interactions 1534
Feature packaging 1534
Feature implementation 1535
Task summary list 1535
Feature operation 1535

Description

This feature adds the Recall with Priority during Night Service (RPNS) functionality to a network-wide application. For this network application, RPNS is activated on a customer basis from an Attendant Console, according to the NITE service specifications defined in the *Network Attendant Service* feature description.

If NAS is not active, then conventional attendant service and Night Service are in effect.

Service is provided as follows when NAS is activated:

- If Night Service is not active (the NITE key is dark), calls are routed to a Local or Remote attendant.

- If Night Service is active at a local node (the NITE key is lit), the call is directed to a Remote attendant, queued to a route, or presented to a Night Station. If the NAS schedule does not define an alternative attendant location for this period:
  - — If the call is local, night service is given or
  - — If the call is from a Remote node, it is routed to its originating node if Drop Back is allowed. If Drop Back is not allowed, Night Service is given at the node receiving the call.

Operating parameters

This feature applies only to incoming external calls.

Feature interactions

Night Service Improvement or Enhanced Night Service feature

If Recall with Priority during Night Service is equipped along with either the Night Service Improvement or Enhanced Night Service feature, calls are processed according to priority.

Feature packaging

International Supplementary Services (SUPP) package 131 is required for Recall with Priority during Night Service.

Since Network-wide LDN requires Network Attendant Service routing, the following existing software packages must also be provisioned:

- Basic Routing (BRTE) package 14;
- Network Class of Service (NCOS) package 32;
- Network Alternate Route Selection (NARS) package 58;
- Network Attendant Service (NAS) package 159; and
- applicable ISDN options depending upon customer requirements.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 15 – Enable the network capability of Recall with Priority during Night Service in the Customer Data Block.

LD 15 – Enable the network capability of Recall with Priority during Night Service in the Customer Data Block.

Prompt	Response	Description
REQ:	CHG	Change.
TYPE:	NIT	Night Service data.
CUST	xx	Customer number.
...		
RPNS	(NO) YES	Recall with Priority during Night Service.

Feature operation

There are no operating procedures specified for this feature.

Redirecting Name Display Enhancement for QSIG Call Rerouting

Contents

Feature description 1537
Operating parameters 1537
Feature interactions 1538
Feature packaging 1538
Feature implementation 1538

Feature description

Dialed Name Display Allowed and Dialed Name Display Denied (DNDA/DNDD) functionality is now supported for Call Rerouting when both the originating and the diverted-to user are on the same node.

Call Diversion notification provides, for QSIG generic functional protocol (GF) interfaces, the capability of displaying the diverted-to user's calling line identification (CLID) on the calling user's telephone when the diverted-to user's telephone is rung during QSIG call diversion.

When both the originating and the diverted-to user are on the same Meridian 1 node and call diversion is performed by the Rerouting method, the originating user’s subscription options have no impact on the diverted-to user’s notification. If the diverted-to user has CLS DNDA, then the diverted-to telephone displays the redirecting name.

Operating parameters

There are no operating parameters associated with this feature.

Feature interactions

There are no feature interactions associated with this feature.

Feature packaging

The Redirecting Name Display Enhancement for QSIG Call Rerouting feature does not introduce any new packages.

This feature requires the following existing packages:

- Q Reference Signalling Point Interface (QSIG) package 263
- QSIG Generic Functional protocol (QsigGF) package 305
- Integrated Services Digital Network (ISDN) package 145
- Multi-purpose Serial Data Link (MSDL) package 222
- Basic Rate Interface (BRI) package 216
- ISDN BRI Trunk Access (BRIT) package 233
- BRI Line Application (BRIL) package 235
- 2 Mb/s Primary Rate Interface (PRI2) package 154
- QSIG Supplementary Service (QSIG-SS) package 316
- International Primary Rate Access (IPRA) package 202
- Call Party Name Display (CPND) package 95

Feature implementation

There are no specific implementation procedures for this feature.

Recorded Announcement for Calls Diverted to External Trunks

Contents

The following are the topics in this section:

Description 1539
Operating parameters 1540
Feature interactions 1541
Feature packaging 1541
Feature implementation 1542
Task summary list 1542
Feature operation 1542

Description

Recorded Announcement for Calls Diverted to External Trunks (RANX) provides an optional recorded announcement when the call is being forwarded to the external Public Exchange through DTI, DTI2, PRI2, PRI, analog, and BRI trunks connected to AXE-10 or EuroISDN routes. The announcement notifies the calling party that call forwarding is taking place and the call set-up can require more time than usual. The delay depends upon the signaling that is required to reach the destination party.

Note: ISDN BRI trunking is not available in North America.

The message is given if the outgoing route is supported by the RANX feature. The calling party receives RAN treatment until either the message is finished or until an answer is received from the external Public Exchange trunk.

This feature operates on a route basis and is controlled by a the RANX prompt in LD 16, for calls diverted to external trunks.

Operating parameters

The RANX feature is supported only for external CO routes. The corresponding RANX prompt in LD 16 appears when the trunk type is:

- A Central Office Trunk (COT) and is not configured as a Radio Paging (RPA) trunk. The trunk has to be configured as an outgoing or outgoing/incoming trunk. The feature is not applicable for trunks configured solely for data traffic.
- A Direct Inward Dialing (DID) trunk configured as an outgoing or outgoing/incoming trunk. The feature is not applicable for trunks configured solely for data traffic.

The RANX feature requires a Recorded Announcement (RAN) machine in the same node as the outgoing route.

If the RAN trunk is configured with supervision, the calling party who is connected to the RAN trunk will be charged from the time the answer signal is sent.

This feature is supported network wide in a Meridian Customer Defined Network (MCDN) environment; no other private network protocols are supported.

Since Digital Private Network Signaling System (DPNSS1) does not support any information concerning redirection, this feature is not supported in a DPNSS1 network.

If a telephone is forwarded to a trunk configured with the RANX feature and the party that calls the extension is supposed to dial additional digits, this is not always possible. If the calling party dials digits when being provided with RAN, those digits will be lost since they are not buffered.

If the outgoing trunk, or the telephone from which the call originated, times out during the RAN, it is not possible to dial additional digits after the RAN is terminated.

If a DISA call is forwarded to a route with the RANX feature configured, and the RAN message that is provided to the calling party is longer than the duration of the EOD timer, the RAN will be interrupted when the EOD timer expires. When the EOD timer expires, the call is considered as established.

Feature interactions

Call Forward All Calls/Busy/No Answer/Hunt

RANX is activated if the call is forwarded to an outgoing external CO trunk with the RANX feature active.

Network Call Forward

The RANX feature supports call forward to an outgoing external CO route if the route has RANX configured and is located in a node with a RAN trunk. The originating party and the forwarded telephone may be in different nodes in the MCDN network.

Internal Call Forward

The RANX feature supports call forward to an outgoing external CO trunk if the route has RANX configured and is located in a node with a RAN trunk.

Phantom TN

If a Phantom TN is forwarded to an external outgoing CO route and the RANX feature is configured for this route, the calling party that is forwarded due to the Phantom TN feature will be provided with a recorded announcement.

Expensive Route Warning Tone

If the calling party is being forwarded to a route with the RANX feature and the Expensive Route Warning Tone feature configured, the Expensive Route Warning Tone will be heard prior to the recorded announcement.

Feature packaging

The following software packages are required:

- Recorded Announcement (RAN) package 7
- Intercept Treatment (INTR) package 11

Note: The use of this feature is not recommended if the outgoing external Central Office (CO) route is not configured with answer supervision.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 16 – Configure Recorded Announcement for Calls Diverted to External Trunks in the Route Data Block.

LD 16 – Configure Recorded Announcement for Calls Diverted to External Trunks in the Route Data Block.

Prompt	Response	Description
REQ	NEW CHG	New, or change.
TYPE	RDB	Route Data Block.
DLDN	YES	YES if no CPG configured.
...		
FORM	aaa	Signaling format.
ICOG	IAO	Incoming and/or outgoing trunk.
RANX	(NO) YES	(RAN not requested when a call is forwarded to this route), RAN is requested when a call is forwarded to this route.
RANR	0-511	The Route Number for the RAN route (appears only if RANX = YES)
	0-127	For Option 11C.
...		

Feature operation

There are no operating procedures specified for this feature.

Reference Clock Switching

Contents

The following are the topics in this section:

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Description 1543
Operating parameters 1544
Feature interactions 1544
Feature packaging 1544
Feature implementation 1544
Task summary list 1544
Feature operation 1545

Regional material statement

The information presented in this section does not pertain to all market regions. Contact your system supplier or your Nortel Networks representative to verify support of this product in your area.

Description

Reference Clock Switching allows a Clock Controller reference to automatically switch to another tracking reference if the reference goes into a non-acceptable state (the Clock Controller can track on its primary reference, secondary reference, or be in free run). A non-acceptable state is considered as one of the following:

- The reference loop is disabled;

- For PRI2, one of the following group 2 errors is detected on the reference loop:
  - — Far end is in out -of -service state
  - — Far end has lost Multiframe Alignment Signal
  - — Alarm Indication Signal is sent
  - — Loss of Frame Alignment
  - — Loss of Multiframe Alignment
- For DTI2, if the reference loop is in Out -of -Service grade of service, or if the reference loop is in No New Call state (if the OOS is inhibited)

Operating parameters

There are no operating parameters specified for this feature.

Feature interactions

There are no feature interactions specified for this feature.

Feature packaging

The following packages are required for Reference Clock Switching:

- International Supplementary Features (SUPP) package 131 **and one or both of:**
  - — 2.0 Mb Digital Trunk Interface (DTI2) package 129
  - — 2.0 Mb Primary Rate Interface (PRI2) package 154.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 60 – Enable automatic switch over of system clock sources on the Clock Controller by using the EREF command.

2 LD 73 – Define the grade of service timers for the DTI card.

LD 60 – Enable automatic switch over of system clock sources on the Clock Controller by using the EREF command.

LD 73 – Define the grade of service timers for the DTI card.

Prompt	Response	Description
REQ	NEW CHG	New, or change.
TYPE	DTI2 PRI2 JDMI	2.0 Mbit Digital Trunk Interface. 2.0 Mbit Primary Rate Interface. Japan Digital Multiplex data block.
FEAT	SYTI	System Timers.
...		
CCGD	0-(15)-1440	Clock Controller free run Guard time.
CCAR	0-(15)	Clock Controller Audit Rate.
EFCS	YES	Enable Fast Clock Switching.

Feature operation

There are no operating procedures specified for this feature.

Remote Virtual Queuing

Contents

The following are the topics in this section:

Description 1547
Operating parameters 1548
Feature interactions 1551
Feature packaging 1552
Feature implementation 1553
Task summary list 1553
Feature operation 1556

Reference list

The following are the references in this section:

Electronic Switched Network description (309-3001-100)

Description

Remote Virtual Queuing (RVQ) allows a Meridian 1 to perform queuing-type functions on a busy trunk route (B-Channel) in an ISDN network. This feature is similar to the ESN features Coordinated Call Back Queuing (CCBQ) and Call Back Queuing to a Conventional Main (CBQCM). Prior to operating RVQ, you must have a working knowledge of the ESN features. Refer to *Electronic Switched Network description* (309-3001-100) for a complete description of these features.

Remote Virtual Queuing (RVQ) is supported on a private ISDN PRI/ISL network only.

When an outgoing network path is unavailable, Remote Virtual Queuing (RVQ) provides call back queuing. RVQ repeatedly scans ahead on the ISDN trunk to be sure that the entire path, from origination to termination, is available. When a path becomes idle, you are notified and can ring the path again to terminate the call.

Operating parameters

In addition to the function offered by CCBQ and CBQCM, RVQ provides the following:

- There is no limit to the number of nodes in the ISDN network that RVQ searches.
- The originating node has control of the call.
- Data terminals are supported.
- Attendants cannot activate RVQ.
- RVQ is activated only by telephones with Ring Again allowed.
- AUTHCODE is supported on the first tandem node only.
- Trunk Access Codes are not supported.
- ACD DNs are supported as a terminating DN.
- Attendants are supported as terminating stations.

RVQ is supported in a private ISDN PRI/ISL network only. Any trunk other than an ISDN PRI or ISL trunk is considered a Non-RVQ Compatible (NRC) trunk. NRC trunks include analog trunks, T1 trunks, or public trunks. NRC also includes trunks connecting to a non-Meridian 1, or non-ISDN.

Meridian Modular, 500/2500, SL-1, and Meridian digital telephones can activate and receive RVQ calls.

The RVQ retry timer is set for each NCOS. Setting a specific NCOS with a low retry timer searches for more connections more often. The lower the timer, the greater the chance to connect the call.

The maximum total amount of time RVQ searches for available paths is 30 minutes. The countdown begins as soon as the originator activates the Ring Again key.

Only one RVQ Ring Again attempt per set is allowed at one time. If Ring Again is pressed again, after activating it for RVQ, the most recent number dialed is the one attempted.

RVQ does not check the terminating telephone's status. The dialed DN may be invalid or busy. Once the path is available, the RVQ call can reach the dialed DN. It is possible that the dialed telephone is busy, and Network Ring Again may be used if enabled. The tone indicating that the trunks are busy is a fast busy tone. A busy DN is indicated by a standard busy tone.

RVQ searches throughout Meridian 1 networks only. Off-net trunk paths cannot be checked beyond the first NRC trunk.

RVQ is a virtual queuing feature. Each RVQ call is independent of another. It does not operate by first in first out policy. The first caller to initiate RVQ is not necessarily the first person connected.

It may take up to 30 seconds for notification to reach the originator. The network path is reserved while RVQ notifies the caller. In a private network, the path is reserved from the originating node to the terminating node. Otherwise the path is reserved up to the first NRC trunk.

RVQ supports Uniform Dialing Plan (UDP) and Coordinated Dialing Plan (CDP). For NRC trunks, the E.164 public numbering plan is supported.

RVQ supports the following trunk types:

- Private network ISDN trunks
  - TIE
  - COT
  - Direct Outgoing Dial (DOD)
  - WATS
  - ISA
  - FEX

RVQ supports only Meridian 1 machines in a private ISDN PRI/ISL network. A non-Meridian 1 machine functioning in tandem with a Meridian 1 machine is treated as a Non-RVQ Compatible (NRC) trunk.

- NRC trunks
  - COT
  - Direct Outgoing Dial (DOD)
  - WATS
  - FEX
  - ISA
  - TIE

RVQ is cancelled if the originating node system initializes.

If the originating node performs a cold start, RVQ is cancelled.

RVQ from a Conventional Main (RVQCM) requires a special configuration. See the “Feature administration” section in this module.

With RVQ, callers cannot activate Ring Again to refuse expensive routes after the Expensive Route Warning Tone (ERWT) is given.

When using RVQ from a Conventional Main (RVQCM), the originating node seizes the same TIE trunk group that was used to initiate RVQCM for the callback. Thus, these trunk groups must be two-way (incoming/outgoing) and configured for far end disconnect.

Conventional mains must provide answer supervision on TIE trunks connected to the originating node. The system must also permit transmission or repetition of telephone dial pulses for RVQCM operation. This feature cannot be used with systems that operate in senderized mode. Operation may require adjustment of the interdigit timeout on systems that employ simulated cut-through operation.

Multiple callback queues are allowed per trunk group for the Conventional main by dialing any digits (up to 7) based on the availability of Meridian 1 call registers.

When utilizing RVQCM, do not call forward the calling telephone when awaiting callback. If the telephone is forwarded, it is possible that the TIE trunk will not be released at the end of the call.

Feature interactions

Drop Back Busy

Drop Back Busy (DBB) and Remote Virtual Queuing (RVQ) are both packaged under the Originating Routing Control/Remote Virtual Queuing (ORC-RVQ) package 192. If RVQ and DBB are both configured, DBB will take precedence over RVQ. If the user wishes to activate RVQ, DBB must be disabled for a route entry in response to the IDBB prompt. If the user wishes to activate DBB, it must be enabled by entering DBI or DBA. Refer to the "Feature administration" section for more information.

Coordinated Call Back Queuing

CCBQ and RVQ can both be enabled on a single machine.

Call Back Queuing to a Conventional Main

CBQCM and RVQ can both be enabled on a single machine.

Call Page Network Wide

RVQ is supported for an incoming call to a Paging trunk when all the trunk members of the dialed Paging route are busy.

Direct Inward System Access

DISA DNs are not supported by RVQ.

ISDN QSIG Basic Call

Remote Virtual Queuing (RVQ) does not operate on the QSIG interface. The existing RVQ operation on unsupported interface applies on the QSIG interface.

Make Set Busy

RVQ can be originated by, and terminated on, an ACD DN in Make Set Busy Mode.

Network ACD

If a target agent is available on a Remote node, RVQ cannot be activated if the busy trunk is found on its way to the target node.

Network Call Redirection

RVQ does not guarantee connection if the terminating telephone call forwards to a telephone on another node. When a terminating telephone call forwards to another node, that node is a redirected node. RVQ cannot search between terminating and redirected nodes.

Network Ring Again

Network Ring Again (NRAG) is activated only when the terminating telephone or console is busy. If both the network path and the terminating telephone are busy, RVQ is activated first. When the path is available, but the telephone is busy, NRAG can be activated.

Off -Hook Queuing

RVQ and Off- Hook Queuing (OHQ) are compatible in a system. If OHQ is configured, it is implemented by leaving the handset off -hook. RVQ is implemented by pressing the Ring Again key. Choosing one or the other method activates the specified feature.

Feature packaging

The following packages are required for Remote Virtual Queuing:

- Main Network Queuing package 38;
- Flexible Call Back Queuing package 61;
- Digital Trunk Interface package 75;
- ISDN signaling package 145;
- ISDN PRI package 146 **or** ISL package 147 **or** 2.0 Mb Primary Rate Access (PRI2) package 154;
- Advanced Network Services package 148 (for NRAG capability);
- ISDN Supplementary (ISDNS) package 161; and
- Originating Routing Control/Remote Virtual Queuing (ORC-RVQ) is package 192.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 86 – Configure the originating node for Remote Virtual Queuing.

2 LD 87 – Configure the originating nodes for CBQ.

3 LD 86 – Configure the outgoing routes of the originating nodes for CBQ (at least one entry of the Initial set of the outgoing route has to allow CBQ.

4 LD 16 – Allow CBQ for the incoming non-ISDN routes on the originating nodes (for RVQ at a conventional Main operation).

LD 86 – Configure the originating node for Remote Virtual Queuing.

Prompt	Response	Description
REQ	CHG	Change.
CUST	xx	Customer number.
FEAT	RLB	Route List Data Block.
RLI	nn	Route List Index.
ENTR	nn	Route List entry number.
ROUT	0-511	Route Number
...	...	...
IDBB	(DBD)	Enter DBD (Drop Back Busy Disabled).
		This will disable Drop Back Busy, and enable Remote Virtual Queuing for the customer.
	DBI	Drop Back if Initial set is busy.
	DBA	Drop Back if all routes are busy.

LD 87 – Configure the originating nodes for CBQ.

Prompt	Response	Description
REQ	CHG	Change.
CUST	xx	Customer number.
FEAT	NCTL	Network Control.
...		
SCBQ	YES	Allow system Call Back Queuing for the customer.
NCOS	nn	Network Class of Service number. The originating telephone must have the same value.
...		
CBQ	(NO) YES	Call Back Queuing is allowed for this NCOS.
RETT	2-(10)-30	Remote Virtual Queuing Retry Timer (Time between searches, in seconds).
RETC	4-(5)-16	Remote Virtual Queuing Retry Counter (Number of times RVQ searches the Initial set before moving on to the Extended set).

LD 86 – Configure the outgoing routes of the originating nodes for CBQ (at least one entry of the Initial set of the outgoing route has to allow CBQ.

Prompt	Response	Description
REQ	CHG	Change.
CUST	xx	Customer number.
FEAT	RLB	Route List Data Block.
RLI	nn	Route List Index.
ENTR	nn	Route List entry number.
ROUT	0-511	Route Number.
...		
CBQ	YES	Allow CBQ.
...		
ENTR	<CR>	
ISET	nn	Size of the Initial set.

LD 16 – Allow CBQ for the incoming non-ISDN routes on the originating nodes (for RVQ at a conventional Main operation).

Prompt	Response	Description
REQ	CHG	Change.
TYPE	RDB	Route Data Block.
CUST	xx	Customer number.
ROUT	xx	Route Number.
...		
CBQ	YES	Allow Call Back Queuing.
...		

Feature operation

RVQ supports private ISDN PRI/ISL networks, non-RVQ compatible (NRC) blocked trunks, and conventional mains (RVQCM). RVQ supports Meridian 1 machines only. A non-Meridian 1 machine working in tandem with a Meridian 1 is treated as a Non-RVQ Compatible (NRC) trunk.

RVQ on a private network

RVQ follows this checklist before starting.

- The first tandem node must be a Meridian 1 node.
- The originating node's Network Class of Service (NCOS) must allow Call Back Queuing (CBQ).
- At least one route in the Initial set of the route list must allow CBQ.
- The system has CBQ allowed at the Network Control Block.

When the checks are complete, activate RVQ by pressing the Ring Again key. As soon as the key is pressed, the retry timer begins. When the retry timer expires, RVQ checks the path again. When a blocked path occurs, RVQ searches the network to ensure that the entire path will be clear once the blockage disappears. The total amount of time RVQ will spend on a search is 30 minutes.

The retry counter controls the number of times the Initial set is checked before RVQ searches the extended set. The extended set search includes all of the trunks in both the Initial and Extended sets.

Tandem nodes must recognize the RVQ messages and pass them on to another tandem or terminating node.

RVQ with NRC trunks

RVQ searches the path until it reaches the first Non-RVQ Compatible (NRC) trunk. RVQ notifies the originator when that trunk is available, but cannot search beyond it. It is possible that the path may be blocked beyond the NRC trunk, and the call cannot go through.

Any trunk other than an ISDN PRI or ISL trunk is considered an NRC trunk. NRC trunks include analog, T1, or public trunks, as well as trunks connecting to a non-Meridian 1, or non-ISDN node.

When an NRC trunk is busy, RVQ follows this checklist before implementing RVQ.

- First tandem node must be a Meridian 1 node.
- Originating node's NCOS must allow Call Back Queuing (CBQ).
- At least one route in the initial set of the route list must allow CBQ.
- The system has CBQ allowed at the Network Control Block.

When the checks are complete, activate RVQ by pressing the Ring Again key. As soon as the key is pressed, the retry timer begins. When the retry timer expires, RVQ checks the path again. The total amount of time RVQ will spend on a search is 30 minutes.

The retry counter controls the number of times the Initial set is checked before RVQ searches the Extended set. The extended set search includes all the trunks in both the Initial and Extended sets. Only the first NRC trunk is checked. RVQ cannot search beyond that trunk, even if the subsequent trunks are ISDN PRI/ISL.

RVQ on a conventional main (RVQCM)

A conventional main call is one that comes from a non-Meridian 1 system into the private network through a TIE trunk to a Meridian 1 node.

When the conventional main call enters the network, the default NCOS is assigned to the TIE trunk to determine RVQCM eligibility. Use Authcode last to upgrade the NCOS if necessary.

When a conventional main call is blocked, RVQ checks the following at the first Meridian 1 node to ensure RVQCM can be activated. The Meridian 1 node is considered the Originating node, and controls the call.

- The tandem and terminating nodes must be Meridian 1 nodes.
- The originating node's Network Class of Service (NCOS) must allow Call Back Queuing (CBQ).
- At least one route in the Initial set of the route list must allow CBQ.
- The system has CBQ allowed at the Network Control Block.
- The incoming TIE trunk allows CBQ.

RVQCM is offered to the conventional main caller with a special offer tone (3 beeps). To accept RVQ, enter the calling number. After the same special confirmation tone (3 beeps) is heard, hang up. The originating node begins the retry timer and search process. When the retry timer expires, RVQ checks the path again. The maximum total amount of time RVQ will spend on a search is 30 minutes. When the path is free, the originating node calls the caller back (at the number entered). The phone rings, the same special callback tone (3 beeps) is heard, and the call is connected. RVQCM cannot be cancelled from the conventional main once started.

If the calling telephone is busy, or does not answer the callback, the RVQ callback is placed in a 5 minute suspense state. After 5 minutes have passed, RVQ attempts the callback again. If the calling telephone is still busy, or does not answer, RVQ is cancelled.

The retry counter controls the number of times the Initial set is checked before RVQ searches the Extended set. The Extended set search includes all the trunks in both the Initial and Extended sets.

> ***Note:*** The calling number is accepted only if the database has been configured to accept the given number of digits. If not, or if the caller does not hang up, an overflow tone is given, and the call is disconnected. RVQCM does not verify that the dialed DN is valid or free.

Once started, RVQ cannot be cancelled from the convention main. Operating parameters relating to Call Back Queuing for Conventional Mains (CBQCM) also apply to RVQCM as follows. Refer to the *Electronic Switched Network description* (309-3001-100) module for complete discussions of CBQCM.

Users at Conventional Mains cannot activate Ring Again to refuse expensive routes after the Expensive Route Warning Tone (ERWT) is given.

The node seizes the same TIE trunk group that was used to initiate RVQCM for the callback. These trunk groups must be two way (incoming/outgoing).

Conventional Mains must provide answer supervision on TIE trunks connected to the node. These switches must also permit transmission, or repetition of telephone dial pulses, for RVQCM operation. This feature cannot be used with systems that operate in senderized mode. Operation may require adjustment of the interdigit timeout on systems that employ simulated cut-through operation.

Multiple callback queues are allowed per trunk group for the Conventional Main by dialing up to 7 digits (any digits are allowed) based on the availability of Meridian 1 call registers.

CAUTION

Conventional Mains must not allow RVQCM callback calls to be modified by call transfer or call forward to an outside line. Call modifications like this can result in the TIE trunk not being released at the end of the call.

Ring Again on No Answer

Contents

The following are the topics in this section:

Description 1561
Operating parameters 1562
Feature interactions 1562
Feature packaging 1563
Feature implementation 1563
Task summary list 1563
Feature operation 1564

Description

This feature extends the capabilities of Network Ring Again for ISDN applications.

When the called station goes off-hook and then on-hook, the activating station is rung back in the same way that traditional Ring Again on Busy operates. Ring Again on Busy gives a caller the opportunity, after encountering a busy Directory Number (DN), to ring the DN again when it becomes free. If a dialed DN is busy, or if all the trunks are busy, pressing the Ring Again key asks the system to monitor the dialed DN or trunk. When it becomes available, the system notifies the caller. The call is automatically dialed again when the caller presses the Ring Again key a second time.

Ring Again on No Answer is applied to the originally dialed DN only.

Operating parameters

Ring Again on No Answer cannot be applied:

- if the dialed DN is a Pilot DN
- to Attendant Consoles
- to a station which has been intercepted to the attendant
- to a station which is queued for an attendant
- to a station which has been recalled to an attendant due to misoperation
- to Automatic Call Distribution (ACD) stations
- to a station with Radio Paging active
- to trunks

M1000 series, digital, and M3000 telephones must be equipped with a Ring Again (RGA) key/lamp combination.

Ring Again on No Answer is applied to the originally dialed DN only.

Feature interactions

Call Forward (All Calls)
Call Forward No Answer
Automatic Call Forward

If an unanswered call is forwarded to another station by any of these features, RANA is applied to the originally dialed station.

Hunting

If RANA has been applied to a station going through a Hunt sequence, Ring Again is applied to that station and not the ringing station.

ISDN QSIG/EuroISDN Call Completion

Analog (500/2500 type) sets can have only one Call Completion to Busy Subscriber request at a given time. Meridian 1 proprietary sets can make Ring Again requests based on the number of Ring Again keys programmed on a set.

Feature packaging

The following package is required for Ring Again on No Answer:

- Advanced ISDN Network Services (NTWK) package 148.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 15 – Allow or deny Ring Again on No Answer operation.

2 LD 11 – Define RGA keys against M2317 or M3000 sets.

LD 15 – Allow or deny Ring Again on No Answer operation.

Prompt	Response	Description
REQ:	CHG	Change.
TYPE:	FTR	Features and options data.
CUST	xx	Customer number.
...		
OPT	(RND) RNA	Ring Again No Answer (Denied) Allowed.

LD 11 – Define RGA keys against M2317 or M3000 sets.

Prompt	Response	Description
REQ:	NEW CHG	New, or change.
TYPE:	aaaa	Type of set.
TN	l s c u	Terminal Number.
	c u	For Option 11C.
...		

KEY	xx RGA	Key number, Ring Again Must be key 10 on LOGIVOX telephones. RANA may be activated if OPT = RNA in LD 15. When OPT = RND in LD 15, all sets with the RGA key will only be able to activate Ring Again Busy.

Feature operation

There are no operating procedures specified for this feature.

SDID Number as CLID for EuroISDN Trunks

Contents

The following are the topics in this section:

Regional material statement 1565
Feature description 1565
Type Of Number of Calling Party Number 1566
Connected Number Identification 1567
Operating parameters 1567
Feature interactions 1567
Feature packaging 1568
Feature implementation 1568
Feature operation 1570

Regional material statement

The information presented in this section does not pertain to all market regions. Contact your system supplier or your Nortel Networks representative to verify support of this product in your area.

Feature description

X11 Release 25.40 introduces the SDID number as CLID for EuroISDN Trunks feature.

SDID capability is available for EuroISDN calls that have CLID OPT1 enabled. For BRIE interfaces, the OPT1 option is configured at the CLID prompt in Overlay 16. For PRI2 interfaces, the OPT1 option is configured at the CLID prompt in Overlay 17.

The Send DID Number (SDID) feature sends the Direct Inward Dial (DID) number of a specific DN as Calling Line Identification (CLID) on an outgoing trunk call. SDID replaces the internal DN of the telephone with the DID (external DN) of the telephone. The DID number is obtained from the Incoming Digit Conversion (IDC) table.

The IDC table converts the following:

- the internal DN of the telephone to the external DN of the telephone
- the external DN of the telephone to the internal DN of the telephone

Table 121
Example of an IDC table

Incoming Digits (IDGT)	Converted Digits (CDGT)
4322 (external DN)	726 (internal DN)
8741 (external DN)	12 (internal DN)

Set A with an internal DN of 726 calls Set B. The IDC table converts Set A's internal DN 726 to its external DN 4322. The CLID of Set A is sent to Set B as 4322. If the internal DN is not entered in the IDC table, the internal DN is sent as the CLID.

Set C calls Set D by dialing Set D's external DN 8741. The IDC table converts Set D's external DN 8741 (external DN) to its internal DN 12. Set D's external DN is sent to Set C as the Connected Number (CONN).

Type Of Number of Calling Party Number

The SDID feature allows the Type of Number (TON) of the calling party number to be changed in the Route Data Block (RDB). The TON is changed when the calling party number has an ISDN numbering plan.

Connected Number Identification

The SDID DN (the external DN) is sent to the CO as the Connected Number for an incoming call.

Operating parameters

This feature is only available on EuroISDN routes.

The EuroISDN route must have an IDC table associated with it when SDID is enabled.

This feature replaces the internal DN with the DID DN for the following:

- analog (500/2500 type) telephones
- Meridian Digital telephones
- Basic Rate Interface (BRI) Line telephones
- Attendant Consoles

This feature does not apply to trunks as the originator.

Feature interactions

Automatic Call Distribution

The SDID number as CLID for EuroISDN trunks feature is not applicable to Automatic Call Distribution (ACD), as calls cannot originate from an ACD key.

If the ACD telephone is equipped with an active Single Call Ringing (SCR) key, the DN is obtained from the active key. If the DN has been entered in the IDC table, the external DID number is used. See “ISDN Calling Line Identification Enhancement”.

Business Networking Express

Even though the CLID is changed to the SDID DN, the private CLID or name is not changed.

Call Detail Recording

Call Detail Recording (CDR) is not affected by the SDID feature. The record’s Originating ID (ORIGID) and Terminating ID (TERID) remain as the internal DN.

Call Forward

If a forwarding DN on a EuroISDN trunk is used as CLID and is found in the IDC table, the SDID DN is sent as the CLID.

Calling Party Privacy

The Calling Party Privacy (CPP) feature is not affected by SDID.

Direct Inward System Access

Direct Inward System Access (DISA) numbers are not affected by the SDID feature.

EuroISDN Trunk – Network Side

The SDID number as CLID feature is supported on the network side of the EuroISDN trunk.

Feature packaging

The SDID number as CLID for EuroISDN trunks feature requires the following packages:

- Incoming Digit Conversion (IDC) package 113
- International Supplementary Features (SUPP) package 131
- Integrated Services Digital Network (ISDN) package 145

Feature implementation

LD 49 – Define the IDC table.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	IDC	Incoming Digit Conversion.
CUST	xx	Customer Number.
DCNO	0 – 254	Day IDC tree number.

FDID	(NO) YES	Flexible DID.
SDID	(NO) YES	Send DID number instead of internal DN.
IDGT	xxxx xxxx	Incoming Digit or range of digits where: xxxx = 0 – 9999.
xxxx	yyyy	Converted Digits (CDGT).
IDGT	xxxx xxxx	Incoming Digit or range of Digits where: xxxx = 0 – 9999.
xxxx	yyyy	Converted digits (CDGT).

LD 16 – Define the Route Data Block (RDB) for ISDN trunks.

Prompt	**Response**	**Description**
REQ	NEW CHG	Add new data. Change existing data.
TYPE	RDB	Type of data block = RDB (route data block).
ROUT	xxx	Route Number where: xxx = 0 – 511 (large systems) xxx = 0 – 127 (small systems).
....	....	
ISDN	(NO) YES	Integrated Services Digital Network option.
....	....	
- SDID	YES	Send DID number instead of internal DN. (NO) = default.

-- CTON	 (NCHG) UKWN INTL NATL LOCL	Call Type of Number. Call Type is not changed. Unknown Call Type. International Call Type. National Call Type. Subscriber Call Type.
....	....	
IDC	YES	Incoming DID Digit Conversion on this route.
- DCNO	xx	Day IDC tree number where: xx = (0) – 254.
- NDNO	xx	Night IDC tree number where: xx = 0 – 254.
....	....	

Feature operation

No specific operating procedures are required to use this procedure.

Software Defined Network Access

Contents

The following are the topics in this section:

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Description 1571
Operating parameters 1572
Feature interactions 1572
Feature packaging 1572
Feature implementation 1572
Task summary list 1572
Feature operation 1573

Regional material statement

The information presented in this section does not pertain to all market regions. Contact your system supplier or your Nortel Networks representative to verify support of this product in your area.

Description

AT&T's Software Defined Network (SDN) provides the equivalent of a private network. The network is controlled by customized call-processing specifications stored in the AT&T network, rather than at customer sites. To access SDN, the customer uses access lines from their location to the AT&T network.

SDN can transmit voice, data, or graphics. Analog transmission to 9600 bps and 56 kbps or 64 kbps clear end-to-end digital data transmission are supported.

Operating parameters

There are no operating parameters associated with this feature.

Feature interactions

There are no feature interactions associated with this feature.

Feature packaging

This feature is included in base X11 System Software.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 17 – Configure the AT&T interface type.

2 LD 16 – Configure a TIE route. Routes defined for access to AT&T services, such as SDN, must be TIE trunk routes.

LD 17 – Configure the AT&T interface type.

Prompt	Response	Description
REQ	CHG	Change
TYPE	CFN	Configuration Record
ADAN	NEW DCH xx	Add a primary D-channel
CTYP	DCHI MSDL	Card type
DNUM	xx	Device number: physical port (odd) for D-channel on DCH, physical card address for MSDL or DDCH.
- PORT	xx	Port number on MSDL or card

Prompt	Response	Description
USR	PRI ISLD SHA	D-channel mode
PRI	xxx yy	Additional PRI loops using the same D-channel, and interface ID
IFC	ESS4 ESS5	AT&T 4ESS or 5ESS

LD 16 – Configure a TIE route. Routes defined for access to AT&T services, such as SDN, must be TIE trunk routes.

Prompt	Response	Description
REQ	NEW CHG	Add or change data
TYPE	RDB	Route data block
CUST	xx	Customer number
ROUT	xx	Route number
TKTP	TIE	TIE trunk route
ISDN	YES	
- IFC	ESS4 ESS5	AT&T 4ESS or 5ESS
- SRVC	SDN	Software Defined Network

Feature operation

No specific operating procedures are required to use this feature.

Singapore ISDN Restart Message Enhancement

Contents

This section contains information on the following topics:

Feature description 1575
Operating parameters 1576
Feature interactions 1576
Feature packaging 1576
Feature implementation 1576
Feature operation 1576

Feature description

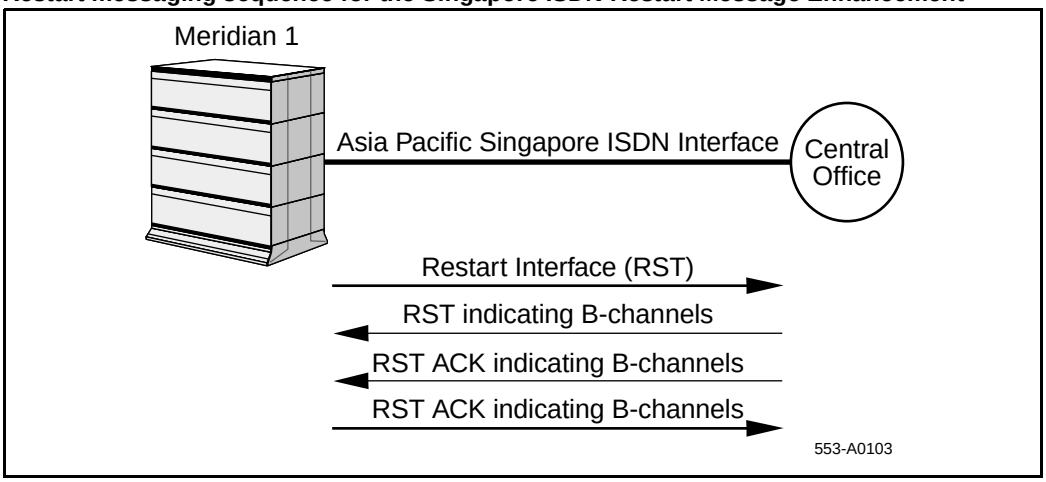
X11 Release 25.40 introduces the Singapore ISDN Restart Message Enhancement. This feature allows Meridian 1 systems with Asia Pacific-Singapore ISDN connectivity to recognize and process Restart Acknowledge messages sent from an Alternate Carrier's Nokia Central Office (CO) switch.

Note: The Alternate Carrier's Nokia CO must be located in Singapore.

With the Singapore ISDN Restart Message Enhancement, the Meridian 1 accepts an Indicated Channels Restart Acknowledge message from the CO. The acknowledge message from the CO is in response to the Meridian 1 Single Interface Restart Message.

Figure 147 shows the Restart messaging sequence between a Meridian 1 and a Nokia CO switch over the Asia-Pacific Singapore ISDN interface.

Figure 147
Restart messaging sequence for the Singapore ISDN Restart Message Enhancement



Operating parameters

There are no operating parameters associated with this feature.

Feature interactions

There are no feature interactions associated with this feature.

Feature packaging

There are no new packages associated with this feature.

Feature implementation

There are no specific implementation procedures associated with this feature.

Feature operation

There are no specific operating procedures associated with this feature.

Software Release ID

Contents

The following are the topics in this section:

Feature description 1577
Operating parameters 1578
Feature interactions 1578
Feature packaging 1578
Feature implementation 1578
Task summary list 1578
Feature operation 1579

Feature description

Software Release ID uses the D-channel connection of your switch to identify the software release of an adjoining switch. This feature identifies the software release of the NRAG, NACD, NMS, and NCRD features. The software release ID can be requested for all direct connections to the Meridian 1. However, the Software Release ID cannot be obtained for switches in a tandem configuration. The information provided by the Software Release ID depends on the interfacing switches. That is, a Meridian 1 switch provides an X11 release number and a DMS-100 switch provides a BCS number.

Note: If the interface is changed, the release ID is also changed. The release ID must then be reconfigured.

This feature prevents software incompatibility between two switches. Different applications are supported by different releases, and for most of the ISDN applications, operations are invoked by sending messages back and forth. To prevent software incompatibility, the following occurs. The release ID of the connecting D-channel is checked before data is sent through the ISDN interface. If the connecting switch does not have the software to handle the feature requested, an application message is not sent. Instead, an error message is printed.

Note: The release ID information is required and supported for connection to Nortel Networks equipment only.

Operating parameters

There are no operating parameters associated with this feature.

Feature interactions

There are no feature interactions associated with this feature.

Feature packaging

This feature is included in base X11 System Software.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 17 – Configure the Software Release ID feature.

LD 17 – Configure the Software Release ID feature.

Prompt	Response	Description
REQ	CHG	Change
TYPE	CFN	Configuration Record
ADAN	NEW DCH xx	Add a primary D-channel
CTYP	DCHI MSDL	Card type

Prompt	Response	Description
DNUM	xx	Device number: physical port (odd) for D-channel on DCH, physical card address for MSDL or DDCH.
- PORT	xx	Port number on MSDL or card
RLS	xx	Release ID of the switch at the far end of the D-channel.

Feature operation

No specific operating procedures are required to use this feature.

Trunk Anti-Tromboning

Contents

The following are the topics in this section:

Feature description 1581
Example of an anti-tromboning operation 1583
Anti-tromboning scenarios 1584
Trunk Anti-Tromboning and Trunk Optimization - Before Answer both equipped on the same Meridian 1 1593
Operating parameters 1605
Feature interactions 1606
Feature packaging 1619
Feature implementation 1620
Task summary list 1620
Feature Operation 1621

Feature description

The purpose of the Trunk Anti-Tromboning (TAT) feature is to optimize tromboned ISDN PRI trunks, ISDN Signaling Link (ISL), Virtual Network Services (VNS) trunks, or analog trunks within an ISDN PRI network. Anti-tromboning will be performed only after the third party answers, and provided that the tromboned PRI/ISL/VNS or analog trunks are associated with the same primary D-channel (with or without a backup D-channel) and the trunks are associated with the same customer. Anti-tromboning will not be performed if the tromboning trunks belong to different customers on the same node (even though they are associated with the same primary D-channel.)

Note: TAT also applies to a call entering a Meridian 1 network over a Central Office trunk. TAT eliminates the tromboning of private network trunks that may occur if the call is redirected or modified.

The term tromboning is used to define a situation whereby two PRI/ISL/VNS trunks, associated with the same D-channel, are being used in parallel. Basically, one PRI/ISL/VNS or analog trunk (B-channel) is established to handle an incoming call from a calling set at the originating node to a called set at the terminating node. A second PRI/ISL/VNS trunk or analog (B-channel) is then established to handle the loop-back of the same call that is redirected from the called station back to a different set at the originating node.

The loop back may result from a call being treated by Network Message Services - Meridian Mail, Network Call Redirection (such as Network Call Forward All Calls, Network Call Forward No Answer, Network Call Forward Busy, and Network Hunting), or by Call Modification (such as a call transfer.) These tromboned trunks are redundant. The Trunk Anti-Tromboning (TAT) feature eliminates these redundant trunks after the call is answered. Refer to "Example of an anti-tromboning operation" on page 1583 for a basic example of how TAT is applied.

TAT may function with a Meridian 1 interworking with another Meridian 1, or Meridian 1 interworking with a DMS-250. In the first case, each Meridian 1 must be equipped with TAT. In the latter case, the DMS-250 must be a Sprint load equipped with the MCDN Release Link Trunk (RLT) feature. In the case of a Meridian 1 to DMS interworking, the trunks may be PRI or VNS.

TAT and Trunk Optimization Before Answer (TRO-BA) may be configured on the same system. In this case, TRO-BA would attempt to optimize the trunks before a call is connected, and TAT would then attempt to optimize the trunks after the call is connected. Please refer to the "Trunk Anti-Tromboning and Trunk Optimization - Before Answer both equipped on the same Meridian 1" on page 1593 for more information and examples.

Example of an anti-tromboning operation

The following example may be used as a basic demonstration of TAT at work within a simple Meridian 1 to Meridian 1 interworking (other interworking scenarios are described in the section Anti-tromboning scenarios beginning on page 1584.

In Figure 148, the following situation exists:

- Station B at the terminating node receives an incoming call over a PRI trunk from Station A at the originating node; or, an incoming CO call is tandemed from the originating node to the terminating node;
- Station B answers the call, and activates Call Transfer to Station C residing at the originating node. A second PRI trunk is established to handle the new call;
- Station B completes the call transfer, leaving Station A connected to Station C (which is in ringing state) using the two PRI trunks. The PRI trunks remain tromboned until Station C answers the call.

Figure 148
Before Trunk Anti-Tromboning operation

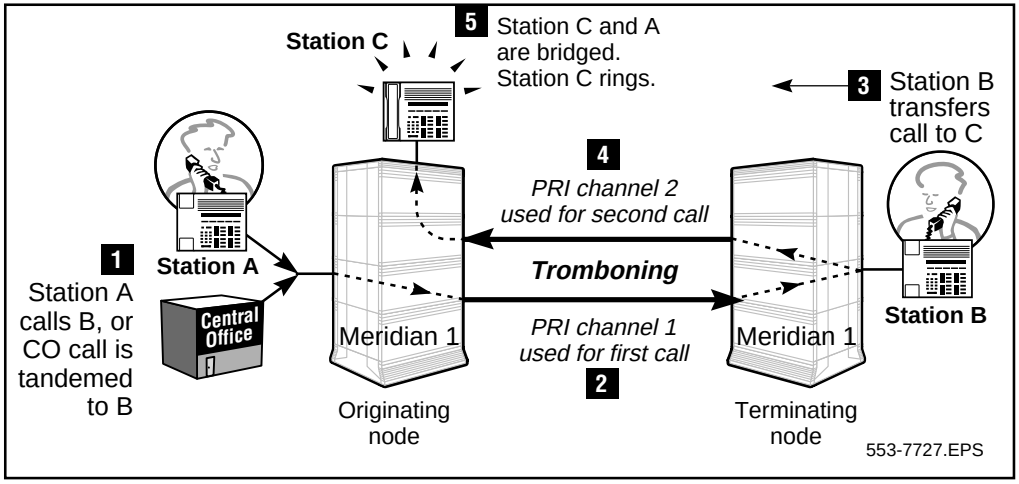
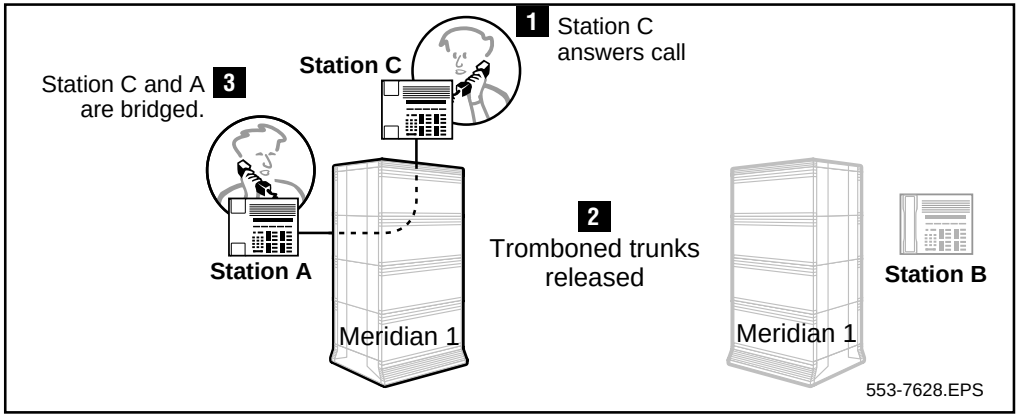


Figure 149 illustrates how the application of TAT eliminates the redundant ISDN PRI B-channels forming the loop-back. After Station C answers the call, Station A and Station C are bridged at the originating node and the redundant trunks are released, provided the trunks involved are associated with the same primary D-channel and customer. This operation eliminates the use of extra network trunking facilities for the duration of the call.

Figure 149
After Trunk Anti-Tromboning operation



Note: If the TAT feature is not supported by either the originating or terminating node, or if the originating node is unable to bridge the call between Station A and Station C, then Station A and Station C remain connected via the tromboned trunks, for the duration of the call. Also, TAT would not release the tromboning trunks if Station A and Station C are both attendants.

Anti-tromboning scenarios

This section provides examples of various anti-tromboning scenarios, as applied with the Meridian 1 interworking with another Meridian 1, and a Meridian 1 interworking with a DMS-250 Sprint load equipped with RLT.

The following legend is used when showing connectivity in the illustrations:

Legend

PRI B-channel, or
ISL or VNS trunk

M1 = Meridian 1 switch equipped with TAT

DMS = DMS-250 Sprint load equipped with RLT

Note: In the examples that follow, the Trunk Optimization Before Answer (TRO-BA) feature is not equipped.

Anti-tromboning operation for Network Call Redirection (case 1), Meridian 1 interworking with DMS

In Figure 150, the following case is represented for TAT as applied to a Network Call Redirection scenario (in the example, a case of a call forward is used), with two Meridian 1 switches interworking with a DMS-250.

- Station A located at an originating switch (Public Central Office or PBX) DMS node, makes an internodal call through a DMS-250 and a tandem Meridian 1 node to Station B located at a terminating Meridian 1 node (first call);
- Station B, located at the terminating Meridian 1 node, is call forwarded through the tandem Meridian 1 node and the DMS-250, to Station C located at the originating switch (redirected call);
- Station C answers;
- Station A connects to Station C.

Figure 150
Anti-tromboning for Network Call Redirection (case 1), M1/DMS

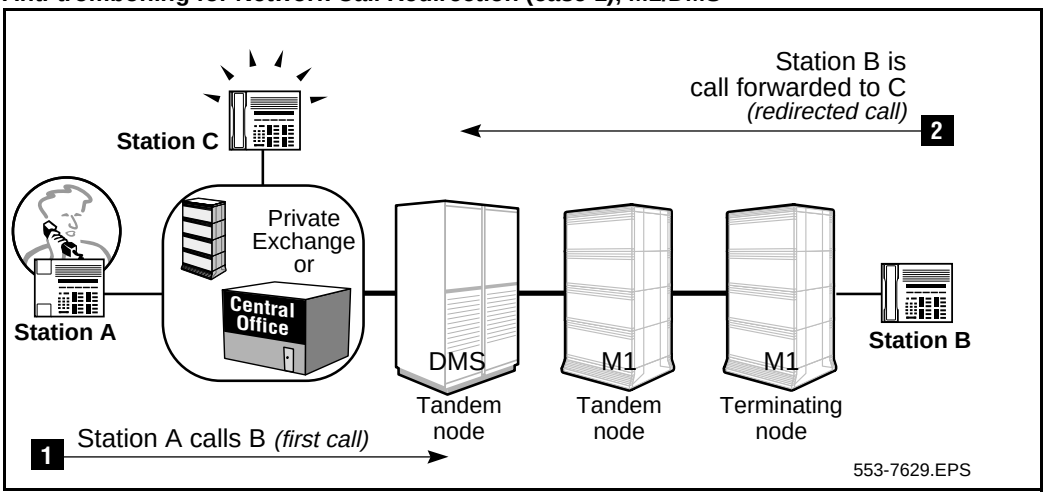
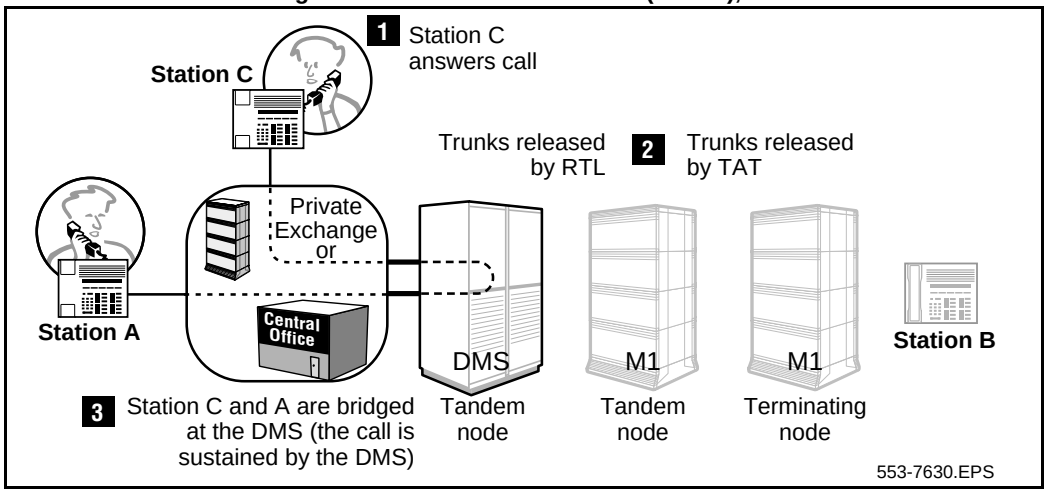


Figure 151 shows the results of antitromboning, after Station C answers the call.

- The call is bridged at the DMS tandem node, between A and C;
- The trunks between the terminating Meridian 1 and the tandem Meridian 1 are released by TAT;
- The trunks between the tandem Meridian 1 and the DMS are released by the RLT feature.

Figure 151
Results of anti-tromboning for Network Call Redirection (case 1), M1/DMS



Anti-tromboning operation for Network Call Redirection (case 2), Meridian 1 interworking with DMS

In Figure 152, another example is presented where TAT optimizes redundant trunks due to a call forward. In this case, the trunks between a terminating Meridian 1 node and tandem Meridian 1 node are optimized. The originating node is a DMS-250. Station C is a centralized attendant or a Meridian Mail position.

- Station A located at an originating switch (Public Central Office or Private Exchange), makes an internodal call through a tandem DMS-250 and a tandem Meridian 1 node to Station B located at a terminating Meridian 1 node (first call);
- Station B, located at the terminating Meridian 1 node, is call forwarded to Station C located at the tandem Meridian 1 node (redirected call). Station C is a centralized attendant or Meridian Mail position;
- Station C answers;
- Station A connects to Station C.

Figure 152
Anti-tromboning for Network Call Redirection (case 2), M1/DMS

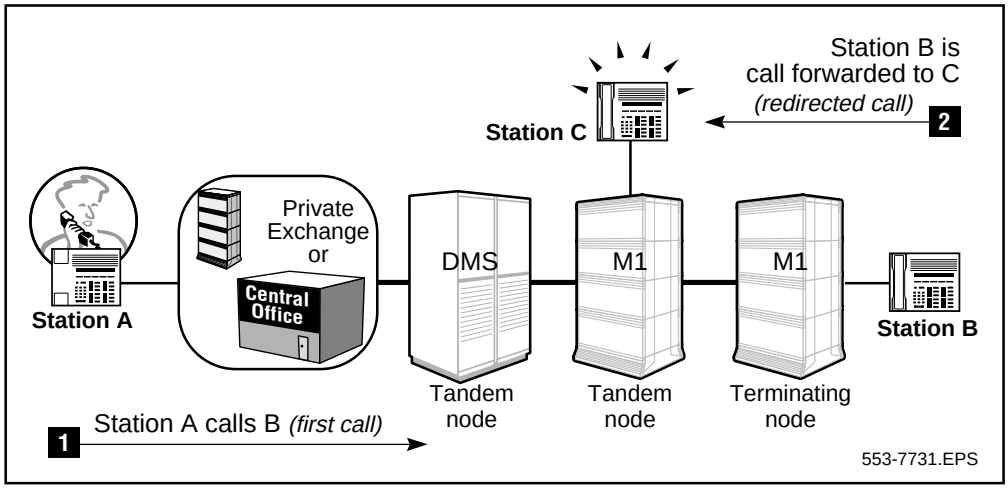
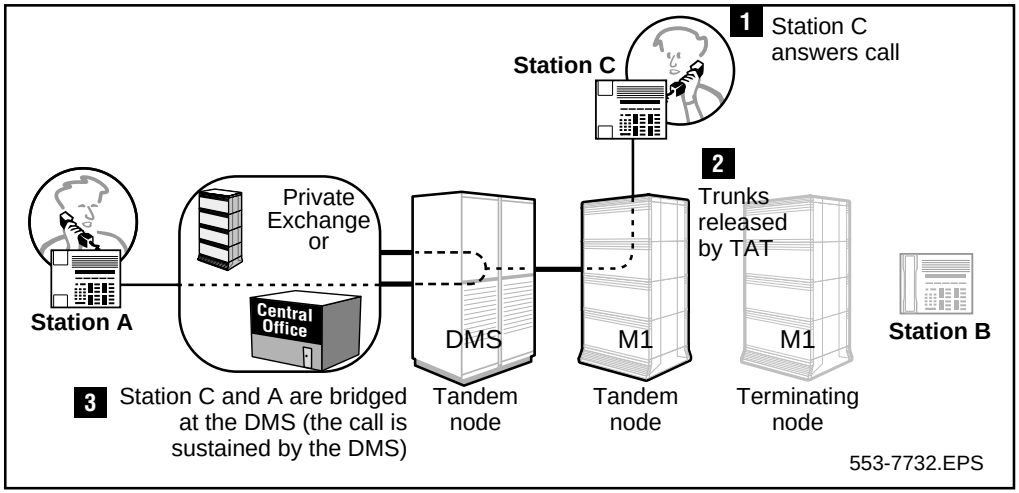


Figure 153 shows the results of antitromboning, after Station C answers the call.

- The trunks between the terminating Meridian 1 and the tandem Meridian 1 are released by TAT;
- Station C and Station A are connected.

Figure 153
Results of anti-tromboning for Network Call Redirection (case 2), M1/DMS



Anti-tromboning operation for Call Modification, DMS interworking with Meridian 1

In Figure 154, the following case is represented for TAT as applied to a Call Modification scenario, with DMS interworking with Meridian 1 (in the example, a case of a call transfer is used. Please note that the same effect would take place if Station B conferences in Station C and then drops out, leaving Station A and Station C connected.)

- Station A, located at an originating Meridian 1 node, makes an internodal call through a tandem DMS node to Station B located at a terminating Meridian 1 node (first call);
- Station B, located at a terminating Meridian 1 node, answers the call and initiates a call transfer, through the tandem DMS node, to Station C located at the originating Meridian 1 node (second call);
- Station C answers;
- Station B completes the call transfer.

Figure 154
Anti-tromboning for Call Modification, DMS/M1

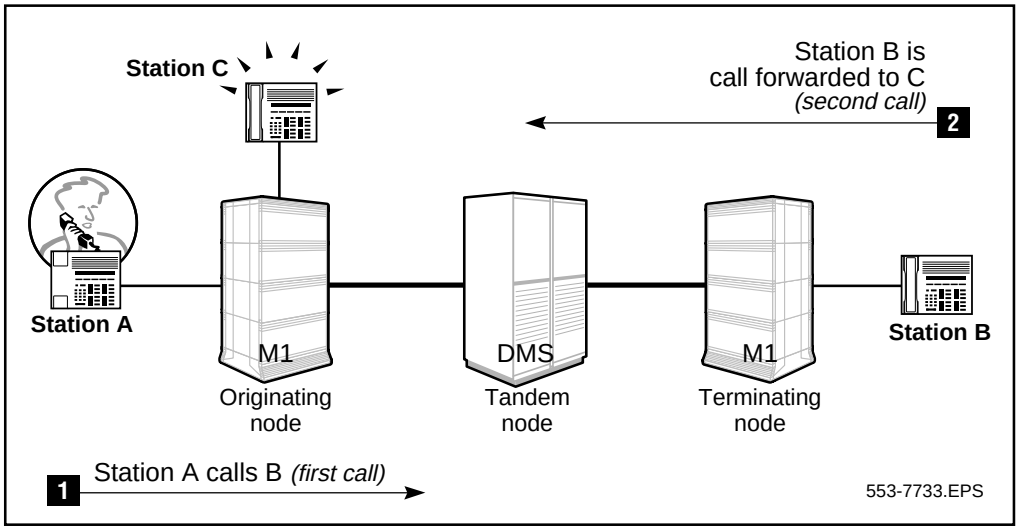
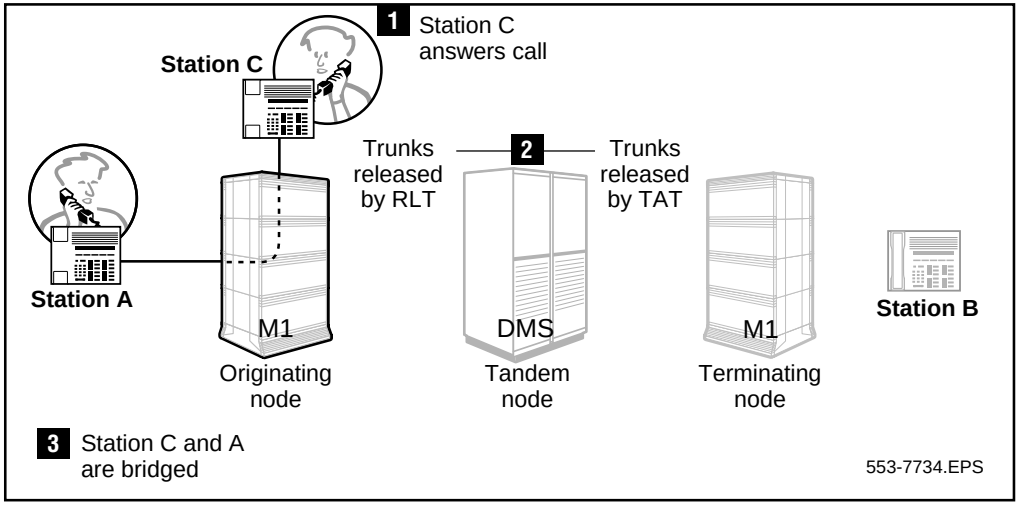


Figure 155 shows the results of antitromboning, after Station C answers the call.

- The call is bridged at the Meridian 1 originating node, between A and C;
- The trunks between the Meridian 1 terminating node and the DMS, and between the DMS and the Meridian 1 originating node and, are released by the RLT feature.

Figure 155
Results of anti-tromboning for network call transfer, DMS/M1



Anti-tromboning operation for Call Modification, Meridian 1 interworking with Meridian 1

In Figure 156, the following case is represented for TAT as applied to a Call Modification scenario, with Meridian 1 interworking with Meridian 1 (in the example, a case of a call transfer is used.)

- Station A, located at an originating Meridian 1 node, makes an internodal call through a tandem Meridian 1 node to Station B located at a terminating Meridian 1 node (first call);
- Station B, located at a terminating Meridian 1 node, answers the call and initiates a call transfer, through the tandem Meridian 1 node, to Station C located at the originating Meridian 1 node (second call);
- Station C answers;
- Station B completes call transfer.

Figure 156
Anti-tromboning for network call transfer, M1/M1

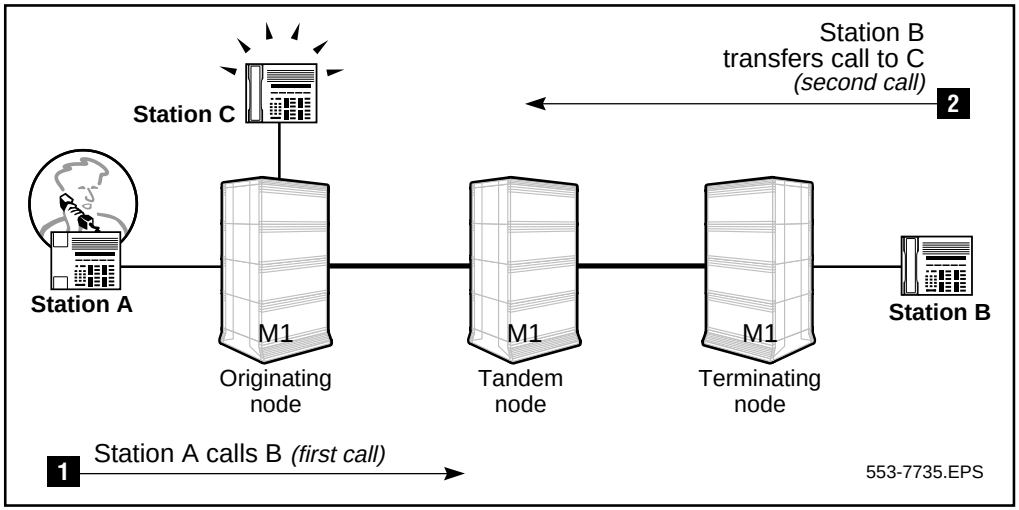
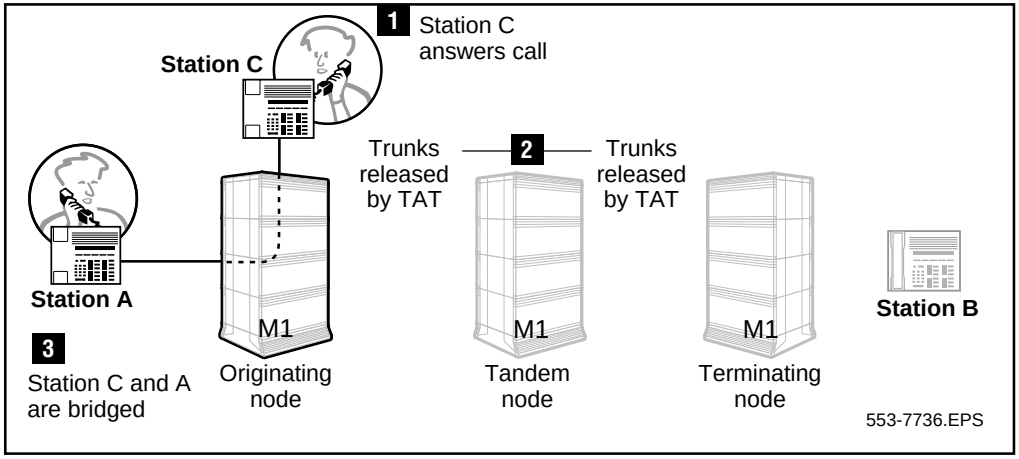


Figure 157 shows the results of antitromboning, after Station C answers the call.

- The call is bridged at the Meridian 1 originating node, between Station A and Station C;
- The tromboning trunks between the Meridian 1 terminating node and the Meridian 1 tandem node, and between the Meridian 1 tandem node and Meridian 1 originating node, are released by TAT.

Figure 157
Results of anti-tromboning for network call transfer, M1/M1



Trunk Anti-Tromboning and Trunk Optimization - Before Answer both equipped on the same Meridian 1

TAT and TRO-BA (including Virtual TRO-BA) may be configured together on the same Meridian 1 switch.

While TAT and TRO-BA both provide trunk optimization capabilities, there are major differences pertaining to how each feature optimizes trunks.

- If TAT and TRO-BA are both configured on the same Meridian 1 switch, TRO-BA takes precedence over TAT (refer to “TRO-BA takes precedence over TAT” on page 1594.) TRO-BA attempts to optimize a route before a call is answered, and then TAT attempts to optimize trunks after the call has been answered. The TAT feature enhances this capability by eliminating redundant trunks between Meridian 1 and DMS-250 switches equipped with the MCDN Release Link Trunk (RLT) feature.
- TAT and TRO-BA both eliminate redundant trunks for calls that are redirected by Network Call Forward All Calls, Network Call Forward No Answer, Network Call Forward Busy, or Network Hunting.
- TRO-BA will not optimize tromboned trunks resulting from a Call Transfer, while TAT will.

- TRO-BA will not optimize tromboned trunks resulting from an incoming trunk call, while TAT will.
- In the case of a call triangulation scenario, TRO-BA will attempt to eliminate tromboned trunks, while TAT will not. However, in this scenario, tromboning may actually result after TRO-BA has performed optimization. In this case, TAT will attempt to optimize the trunks. Refer to “TRO-BA and TAT functionality in a call triangulation scenario” on page 1601.

  Note: For more detailed information on the TRO-BA feature, refer to the ‘Trunk Optimization-Before Answer’ feature description module in this document.

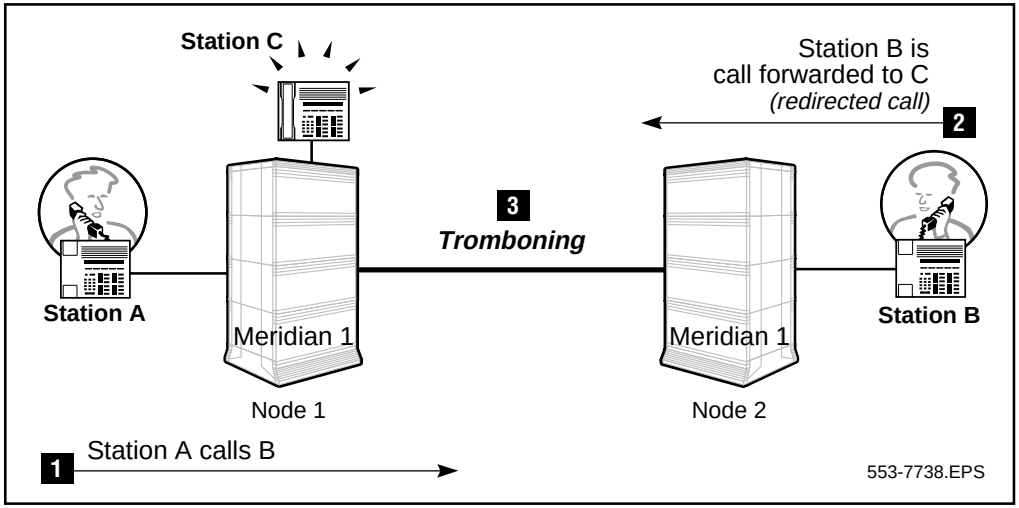
TRO-BA takes precedence over TAT

The following provides a basic example of how TRO-BA takes precedence over TAT in a call forward scenario.

Referring to Figure 158:

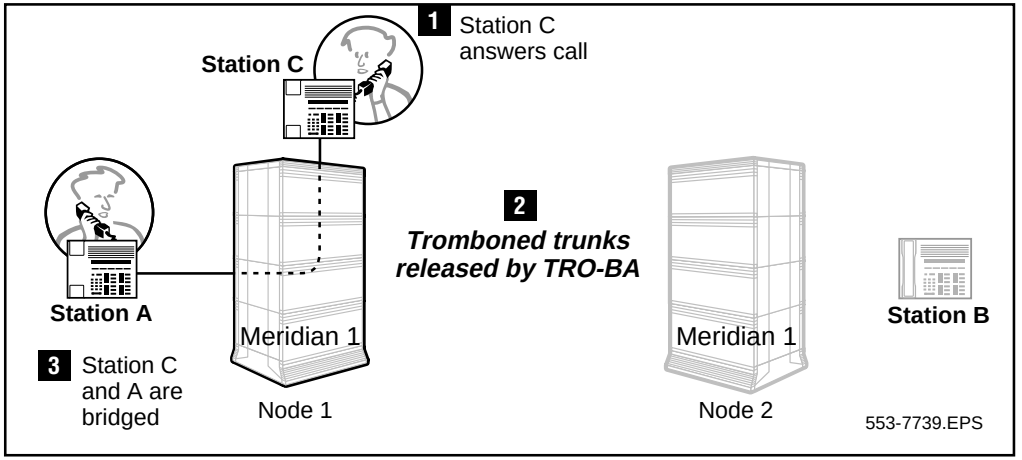
- Station A on Node 1 calls Station B on Node 2, over an ISDN PRI/ISL/VNS trunk;
- Station B on Node 2 is call forwarded all calls to Station C on Node 1, over another PRI/ISL/VNS trunk (redirected call.) This means that tromboning exists between Node 1 and Node 2.

Figure 158
TRO-BA/TAT operating together, before optimization in a call forward scenario



Before Station C answers, TRO-BA releases the tromboned trunks between Node 1 and Node 2, and bridges Station A and Station C locally. Refer to Figure 159. Since there no longer exist any tromboned trunks, TAT is not invoked.

Figure 159
After optimization has been applied by TRO-BA

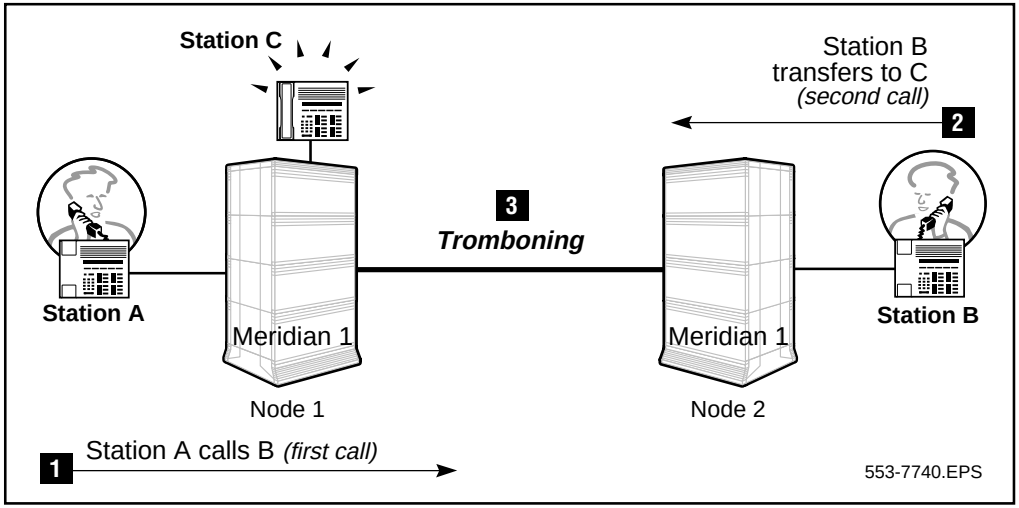


TRO-BA does not optimize trunks due to a call transfer - anti-tromboning is completed after the call is connected

As mentioned, TRO-BA will not release tromboned trunks that result from a call transfer. In this case, TAT will optimize the trunks, after the call is answered. Referring to Figure 160:

- Station A on Node 1 calls Station B on Node 2, over a PRI/ISL/VNS trunk (first call);
- Station B initiates call transfer to Station C on Node 1, over another PRI/ISL/VNS trunk, and completes the call transfer while Station C is still ringing. This means that a case of tromboning exists between Node 1 and Node 2 (second call);

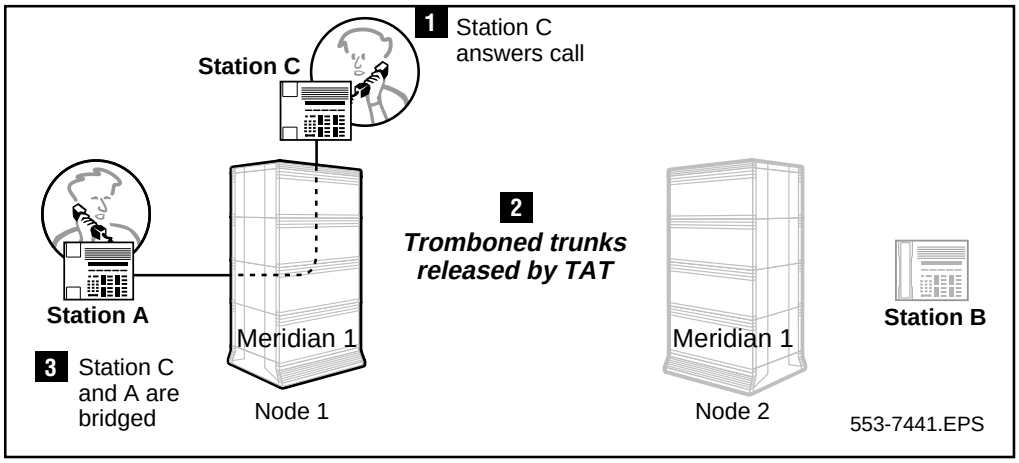
Figure 160
TRO-BA/TAT operating together, before optimization in a call transfer scenario



Since TRO-BA does not release tromboned PRI trunks resulting from a call transfer, the trunks between Node 1 and Node 2 remain tromboned until Station C answers the call transfer.

While the call is still in ringing state, TRO-BA does not release the tromboned trunks. After Station C answers, TAT releases the tromboned trunks between Node 1 and Node 2, and bridges Station C and Station A locally. Refer to Figure 161.

Figure 161
After TAT applied to tromboned trunks due to a call transfer

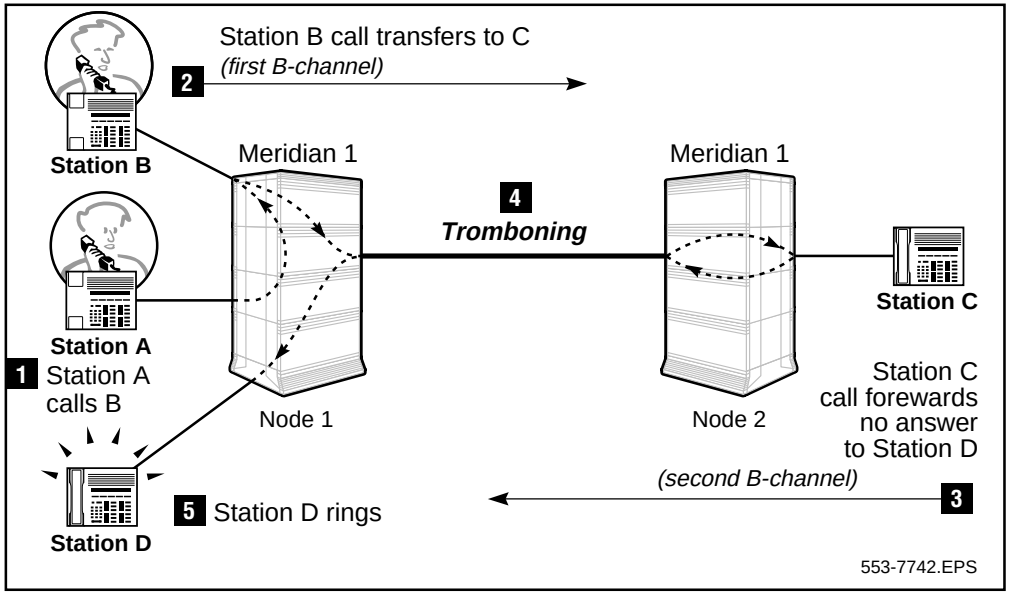


Trunk optimization with call redirection due to call transfer

Another case of TRO-BA and TAT interaction in the case of a call redirection initiated on the transfer key is as follows. Referring to Figure 162:

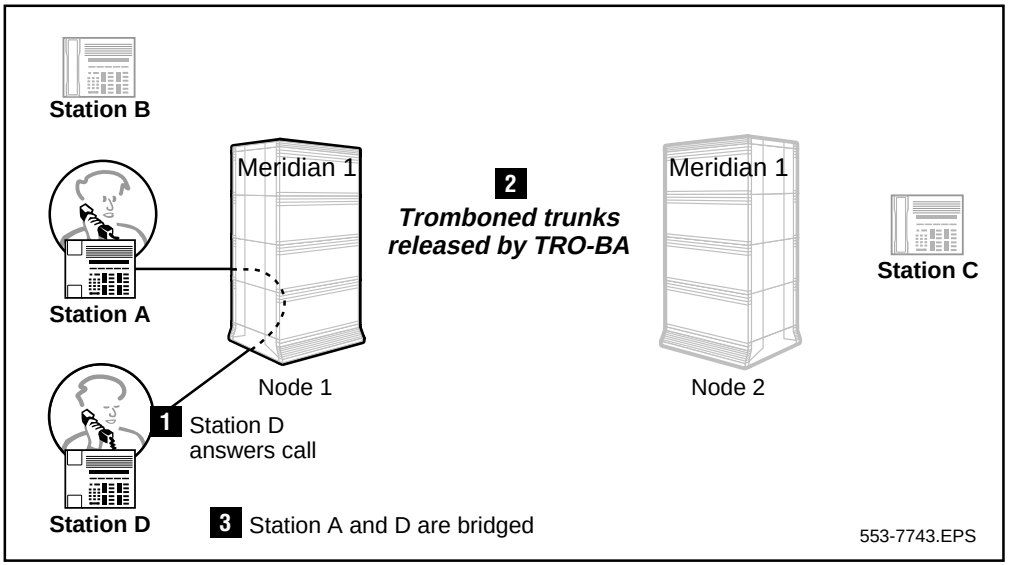
- Station A on Node 1 calls Station B, also on Node 1;
- Station B initiates a call transfer to Station C on Node 2, over a PRI/ISL/VNS trunk (first B-channel);
- Station C call forwards no answer to Station D on Node 1, over another PRI/ISL/VNS trunk (second B-channel, due to call redirection.) Therefore, tromboning of trunks exists between Node 1 and Node 2;

Figure 162
TRO-BA/TAT operating together, before optimization in a call transfer scenario



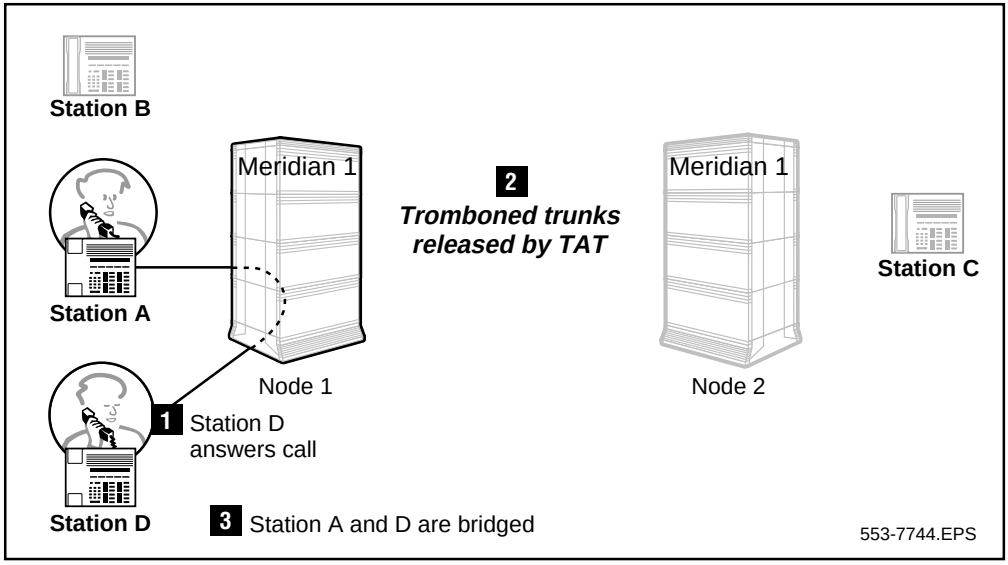
- Station B completes the call transfer while Station C is ringing. After the call is presented to Station D, TRO-BA optimizes the trunks, and bridges Station A and Station D locally. Refer to Figure 163.

Figure 163
Tromboned trunks released by TRO-BA



- If Station B does not complete the call transfer while Station C is ringing, but waits until Station D answers, TRO-BA will not perform optimization.
- After Station D answers, TAT applies antitromboning to release the trunks between Node 1 and Node 2, and bridges Station A and Station D locally. Refer to Figure 164.

Figure 164
Tromboned trunks released by TAT



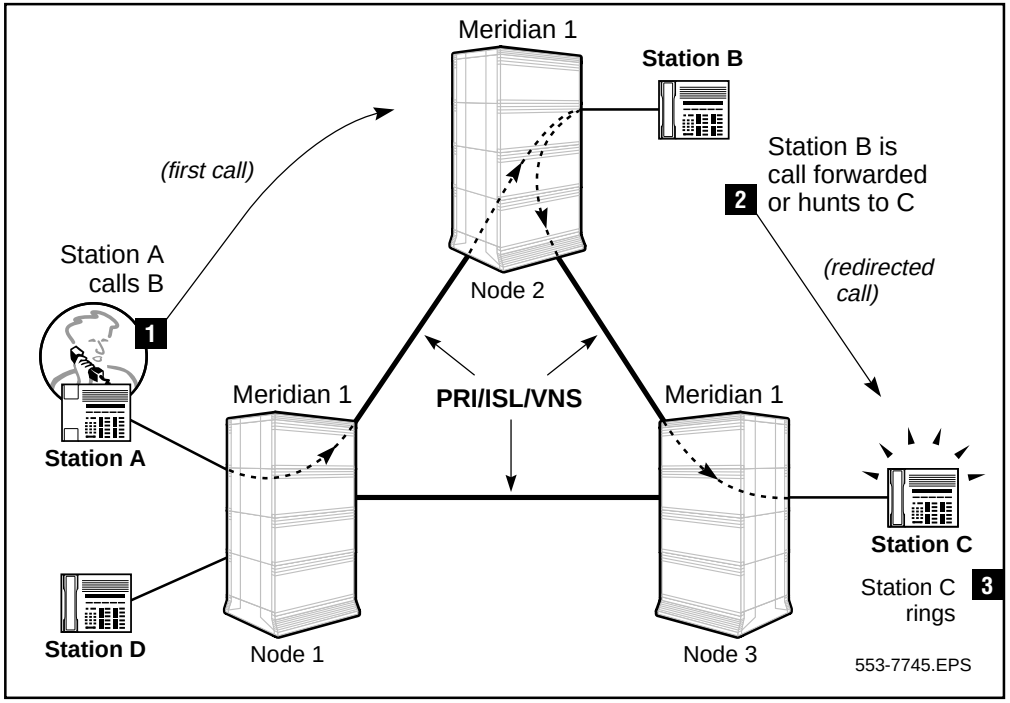
TRO-BA and TAT functionality in a call triangulation scenario

In the case of a call triangulation scenario, TRO-BA will attempt to eliminate tromboned trunks. TAT cannot perform this operation because a second D-channel is involved.

Referring to Figure 165:

- Station A on Node 1 calls Station B on Node 2 over a PRI/ISL/VNS trunk (first call);
- Station B on Node 2 is call forwarded or hunts to Station C on Node 3, over another PRI/ISL/VNS trunk (redirected call.) This means that two trunks are being used to handle one call.

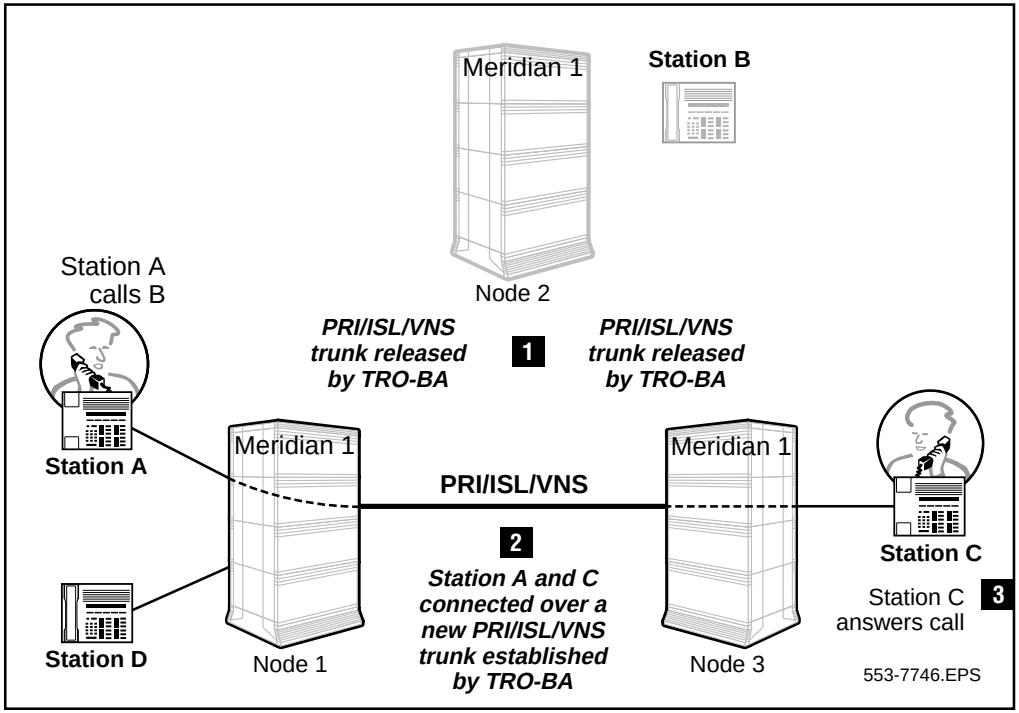
Figure 165
Call path before TRO-BA has been applied



Before Station C answers, TRO-BA releases the trunks between Node 1 and Node 2, and between Node 2 and Node 3, and establishes a new PRI/ISL/VNS trunk connection between Node 1 and Node 3. Refer to Figure 166.

Note: The TAT feature cannot provide this functionality, because multiple D-channels are used.

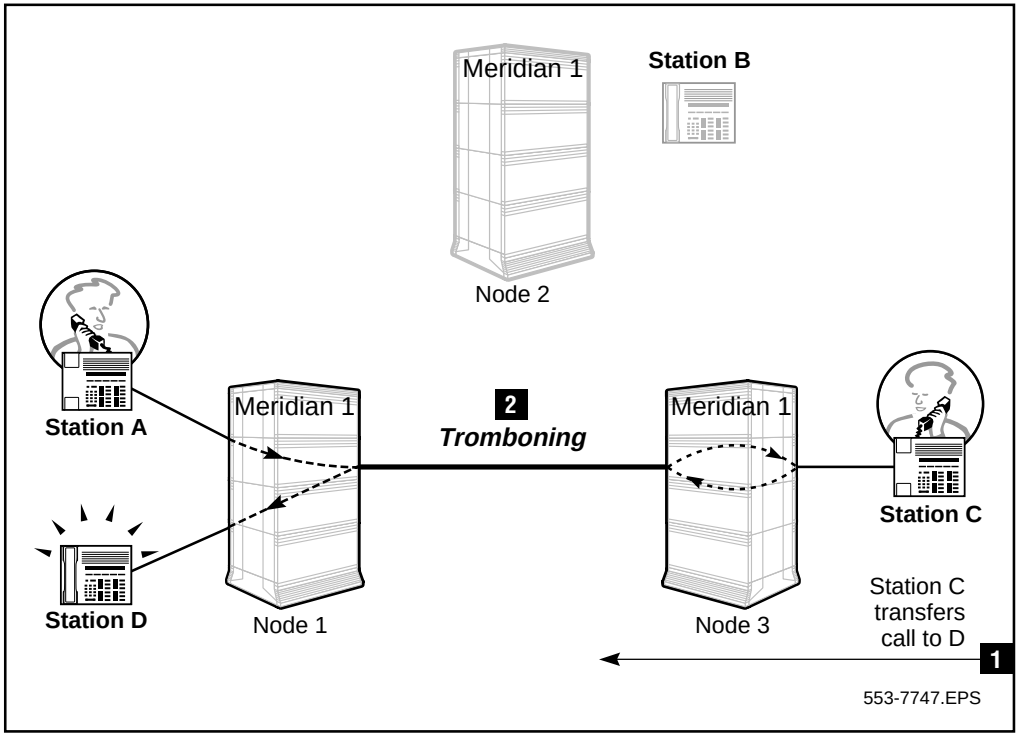
Figure 166
Call path after TRO-BA has been applied



Tromboning may actually result after TRO-BA has performed optimization. In this case, TAT will attempt to optimize the trunks. An explanation whereby this scenario may occur follows.

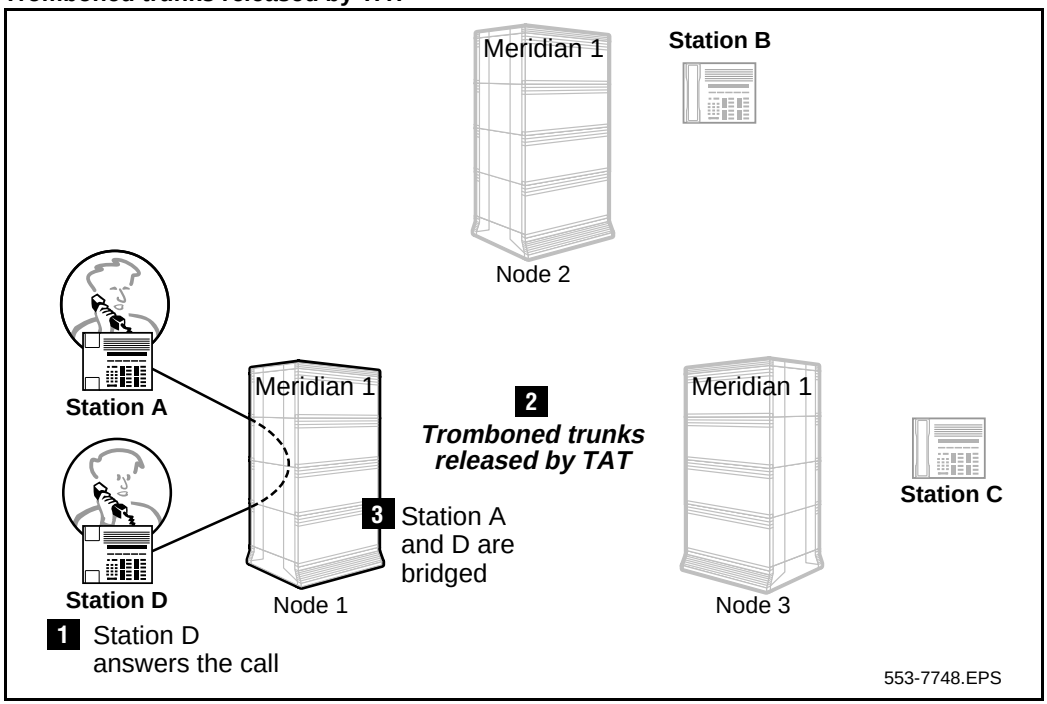
- Station C answers the call, and initiates a call transfer to Station D on Node 1, over a separate PRI/ISL/VNS trunk. This results in tromboning between Node 1 and Node 3. Refer to Figure 167.

Figure 167
Tromboning of trunks after TRO-BA has been applied



- After Station D answers the call, and Station C completes the call transfer, TAT releases the tromboned trunks between Node 3 and Node1, leaving Station D and Station A bridged locally. Refer to Figure 168.

Figure 168
Tromboned trunks released by TAT



Operating parameters

Anti-tromboning will be performed only after the third party answers, and provided that the tromboning PRI/ISL/VNS or analog trunks are associated with the same primary D-channel (with or without a backup D-channel) and the trunks are associated with the same customer. Anti-tromboning will not be performed if the tromboning trunks belong to different customers on the same node (even though they are associated with the same primary D-channel.)

Anti-tromboning will not be performed for a tromboned call between two attendants on the same node.

There are two types of protocols used for TAT operations, depending on the interface type. One is for the Meridian 1 to Meridian 1 interface, and the other is for Meridian 1 to the DMS-250 Sprint load equipped with the Meridian Customer Defined Network Release Link Trunk (RLT) feature.

If non-ISDN PRI trunks are involved in a call transfer call, ISDN signaling messages cannot be sent and anti-tromboning will not be performed.

Anti-tromboning will not be performed for tromboned trunks associated with a call originating on a set, and routed back to the same set.

The Trunk Anti-Tromboning feature will only be supported on the Multi-purpose Serial Data Link (MSDL) card, for D-channel handling.

For Option 11C, the Trunk Anti-Tromboning feature will only be supported on the NTBK51BA D-Channel Daughterboard, for D-channel handling with PRA. To support the Trunk Anti-Tromboning feature within a dedicated ISL/VNS configuration, an NTAK02 (minimum vintage **BB)** SDI/DCH circuit card must be used.

Anti-tromboning will not be performed for ISDN Basic Rate Interface (BRI) trunks, except if the trunks are Virtual Network Services bearer trunks.

TAT can cause a momentary interruption in data transmission during optimization. When TAT operations are performed at multiple tandem nodes, this effect is cumulative (in the milliseconds range.) Therefore, the impact of this loss is dependent on the terminals on both ends of the transmission, and may be recovered through re-transmission.

Feature interactions

Note: The feature interactions described in this section assume that only TAT (and not TRO-BA) is configured on a Meridian 1 system.

If TRO-BA is also configured with TAT on the same system, TRO-BA will take precedence over TAT, where it can.

Attendant

If an attendant has activated Busy Verify or Barge-in at the time that a message to invoke TAT is received, the anti-tromboning operation will be aborted.

Automatic Call Distribution (ACD)

The Trunk Anti-Tromboning feature will perform anti-tromboning operations to eliminate the PRI trunks associated with the same D-channel due to the following ACD operations: Enhanced Network Call Forward; Network ACD; Interflow Options; and Enhanced Interflow.

If an ACD agent is being observed at the time that a message to invoke TAT is received, the anti-tromboning operation will be aborted.

If an incoming PRI call that is in the ACD queue is answered by a Recorded Announcement (RAN), then the anti-tromboning operation will be performed only after an ACD agent answers the call.

Call Park Network Wide

The Trunk Anti-Tromboning feature is invoked if programmed at all interim Private Branch Exchanges (PBXs) in the call.

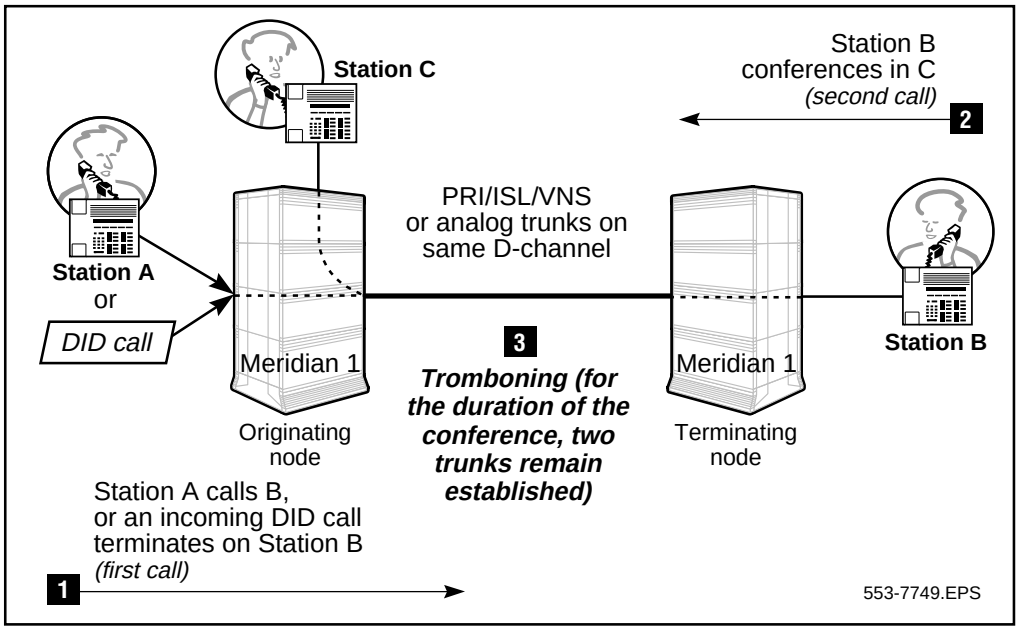
Conference

If the Conference feature is activated, the Trunk Anti-Tromboning feature will perform the anti-tromboning operations only when there are two parties remaining in the call, and the two parties are using PRI trunks associated with the same D-channel.

Referring to Figure 169:

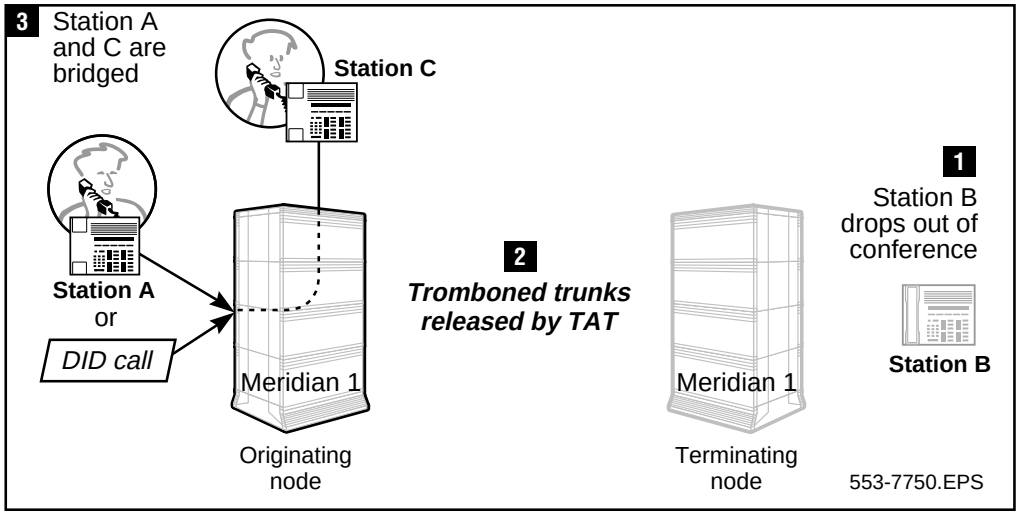
- Station A, or an incoming DID trunk call, at the originating node, is connected to Station B at the terminating node over a PRI/ISL/VNS or analog trunk (first call);
- Station B conferences in Station C, also located at the originating node, over a second PRI/ISL/VNS or analog trunk that is associated with the same D-channel as the first (second call);
- During the extent of the three-party conference, the two trunks are tromboned.

Figure 169
Conference call before TAT



When Station B drops out of the conference, antitromboning is invoked (TAT will not be invoked as long as the conference call situation exists.) The two tromboned trunks are released, and Station A, or the DID trunk, and Station C are bridged. This is illustrated by Figure 170.

Figure 170
Conference call after TAT



Digital Private Signaling System (DPNSS1) Route Optimization

There is no interworking between TAT and DPNSS1 Route Optimization at the MCDN/DPNSS1 gateway.

End to End Signaling

If End to End Signaling is present when TAT is being invoked, then anti-tromboning will be aborted.

External Recorded Announcement.

If an attendant originates a call which, through call modification or call redirection creates tromboned trunks, and eventually terminates on a RANX equipment, TAT will not optimize the trunks. That is, TAT will not release tromboning PRI/ISL/VNS trunks resulting from an attendant initiating an outgoing trunk call.

INIT ACD Queue Call Restore

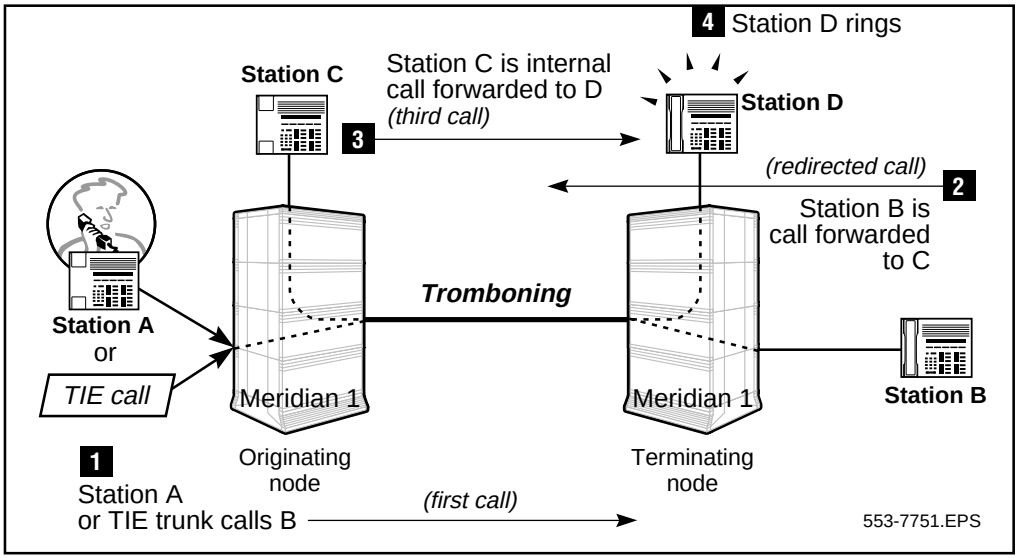
Trunk Anti-Tromboning is not supported on a call restored by INIT ACD Queue Call Restore.

Internal Call Forward (Meridian 1 to Meridian 1)

TAT will not affect the operation of Internal Call Forward between two Meridian 1 switches, while applying antitromboning to trunks. Referring to Figure 171:

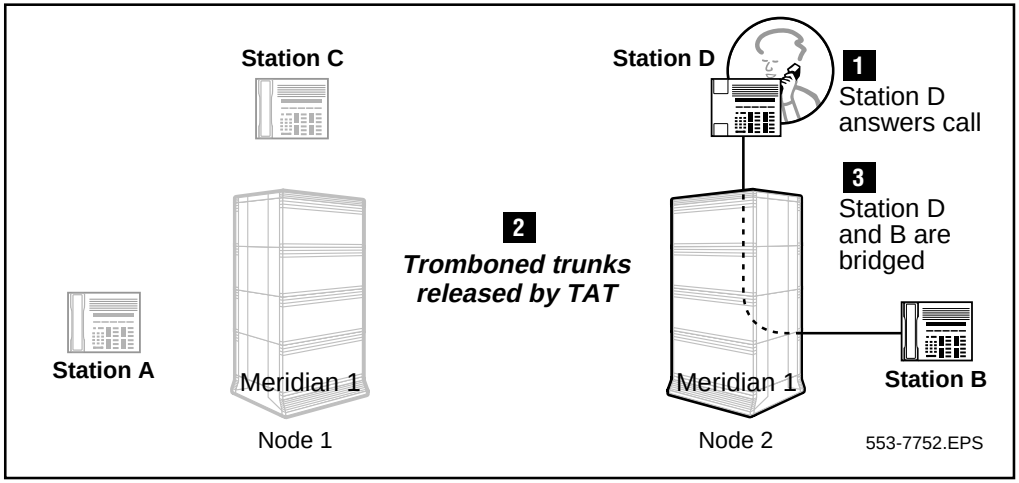
- Station A, or an incoming TIE trunk, on Node 1 calls Station B at Node 2. The call terminates on Station B at Node 2, over a PRI/ISL trunk (first call);
- Station B on Node 2 is call forwarded to Station C on Node 1 (redirected call). The trunks are tromboned.
- If the call is determined to be internal, and Station C is Internal Call Forwarded to Station D, the call is automatically forwarded to Station D on Node 2 over a third PRI/ISL trunk.

Figure 171
Internal Call Forward before TAT, Node 2 is a Meridian 1



After Station D answers the call, TAT releases the tromboned trunks between Node 1 and Node 2. Refer to Figure 172.

Figure 172
Internal Call Forward after TAT, Node 2 is a Meridian 1

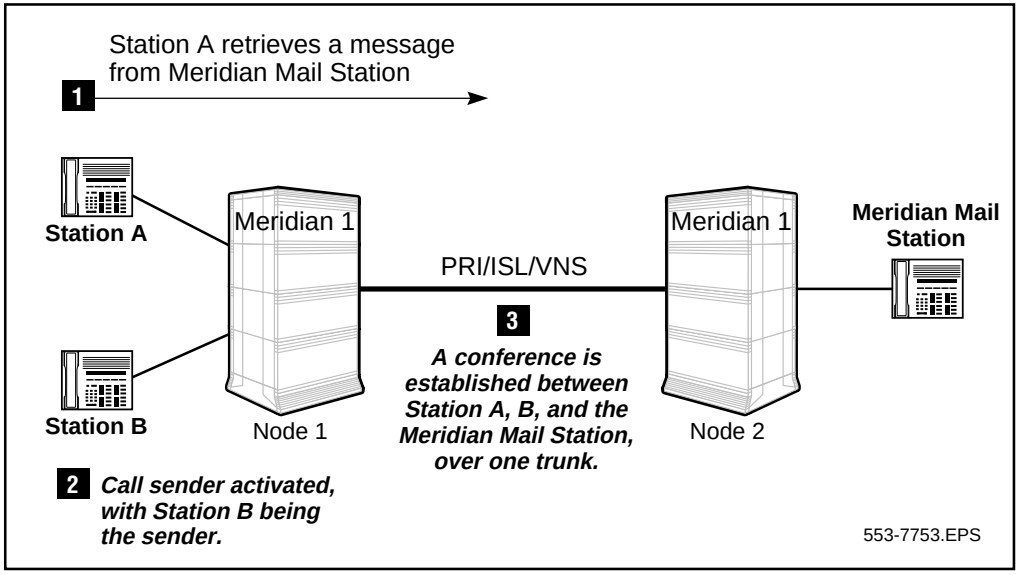


Meridian Mail

The TAT feature will release tromboned PRI/ISL/VNS trunks arising from the application of the Auto Attendant, Thru-Dialing, and Operator Revert capabilities of Meridian Mail. If Network Message Services is activated, the associated Call Sender capability does not create an additional trunk when it is activated. Therefore, TAT is not applied. Referring to Figure 173:

- Station A, on Node 1, retrieves a message from a Meridian Mail station located on Node 2;
- Call Sender is activated, with Station B, located on Node 1, being the sender;
- Station A directly conferences in Station B. A consultation conference between Station A, Station B, and the Meridian Mail station is then established over one PRI/ISL/VNS trunk.

Figure 173
Call Sender operation, with Network Message Services active



Network Attendant Service (NAS)

If both TAT and NAS are equipped in a Meridian 1 network, the NAS feature takes precedence over TAT, if NAS is equipped end-to-end.There is no interworking between NAS and TAT. Refer to Figure 174 for the following calling scenarios.

Scenario 1

Station C at Node 2 calls the attendant at the remote node (Node 3), over a PRI trunk. The attendant extends the call to Station D, also at Node 2, over a separate PRI trunk. These trunks are considered to be tromboned.

Case 1 - TAT and NAS are equipped on all nodes

When Station D answers, The NAS functionality drops the tromboned trunks, and Station C and Station D are bridged.

Case 2 - NAS is not equipped

If NAS is not equipped, TAT performs anti-tromboning operations, removing the tromboned trunks and bridging Station C and Station D.

Scenario 2

Station A at Node 1 calls the attendant at Node 3, and the attendant extends the call to Station B on Node 1.

Case 1 - TAT and NAS are equipped on all nodes

If NAS and TAT are both equipped between Node 1 and Node 2, and between Node 2 and Node 3, then NAS takes predence over TAT to optimize the tromboned trunks between Node 1 and Node 2, and Node 2 and Node 3.

Case 2 - NAS is not equipped

If only TAT is equipped between Node 1 and Node 2, and between Node 2 and Node 3, then TAT will release the tromboned trunks between Node 1 and Node 2, and Node 2 and Node 3.

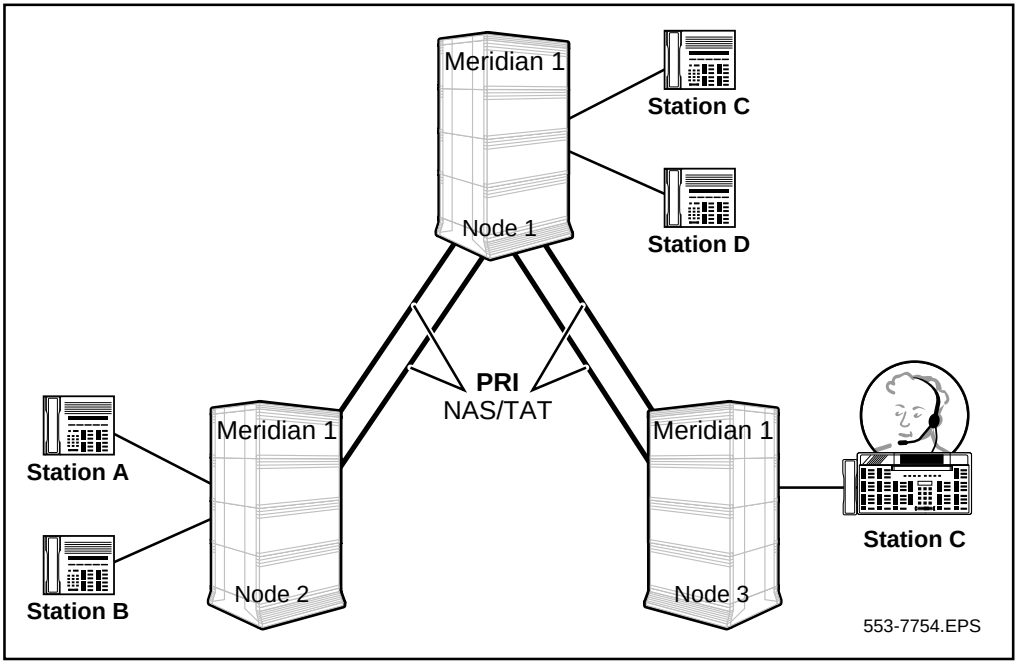
Case 3 - NAS is equipped between Node 1 and Node 2, and TAT is equipped between Node 2 and Node 3

If only NAS is equipped between Node 1 and Node 2, and only TAT is equipped between Node 2 and Node 3, then TAT releases the tromboned trunks between Node 2 and Node 3, and the call is bridged at Node 2. NAS does not optimize the tromboned trunks between Node 1 and Node 2.

Case 4 - TAT is equipped between Node 1 and Node 2, and NAS is equipped between Node 2 and Node 3

If only TAT is equipped between Node 1 and Node 2, and only NAS is equipped between Node 2 and Node 3, no anti-tromboning will be performed, because NAS is not equipped end to end.

Figure 174
NAS/TAT interworking



Network Call Pickup

The TAT feature will optimize tromboned trunks arising from the operation of the Network Call Pickup feature. For example, in Figure 175, Station A on Node 1 makes a call to Station B on Node 2 over a PRI/ISL/VNS or analog trunk. The call is picked up by station C on Node 1, over a separate PRI/ISL/VNS or analog trunk. After the call has been picked up, TAT will apply antitromboning to release the two tromboned PRI trunks. Station A and Station C are connected locally. Refer to Figure 176.

Figure 175
Network Call Pickup before TAT

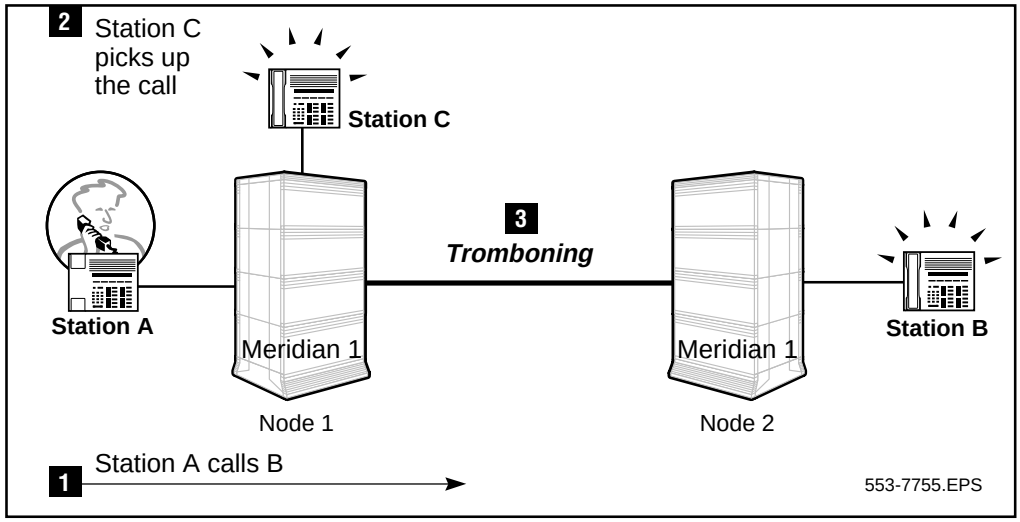
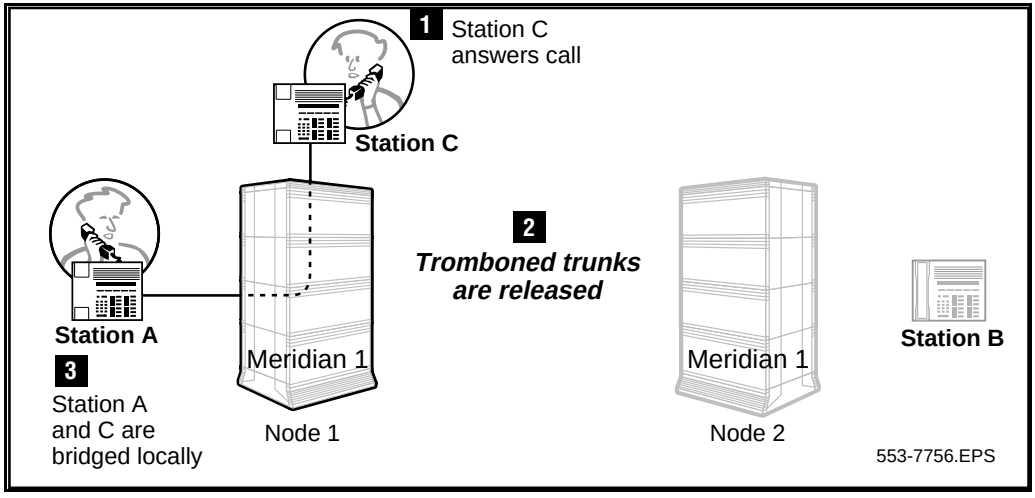


Figure 176
Network Call Pickup after TAT



Network Call Redirection

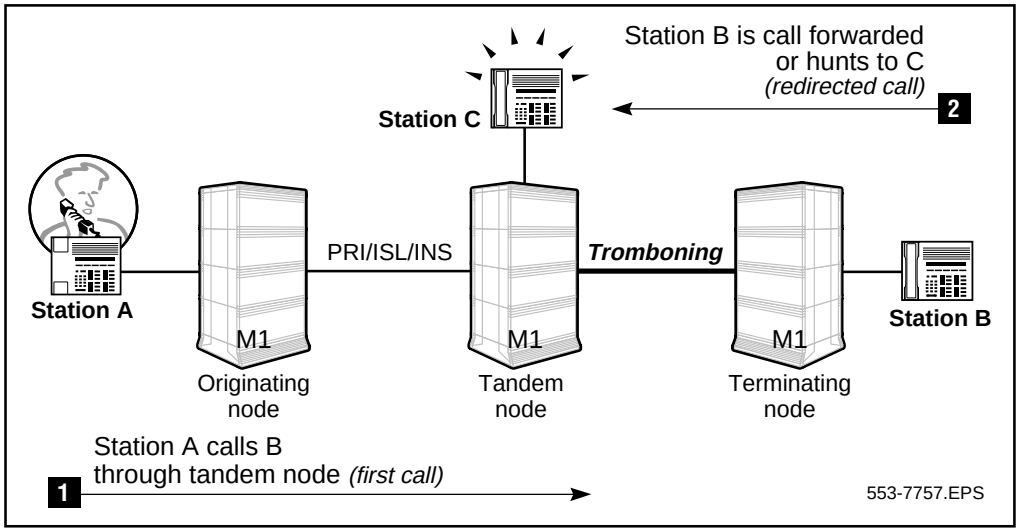
The Trunk Anti-Tromboning feature eliminates the tromboning of PRI/ISL/VNS or analog trunks resulting from the operation of any of the following Network Call Redirection features:

- Network Call Forward Unconditional
- Network Call Forward No Answer
- Network Call Forward Busy
- Network Call Forward by Call Type
- Network Hunt
- Internal Call Forward

Figure 177 illustrates the following scenario:

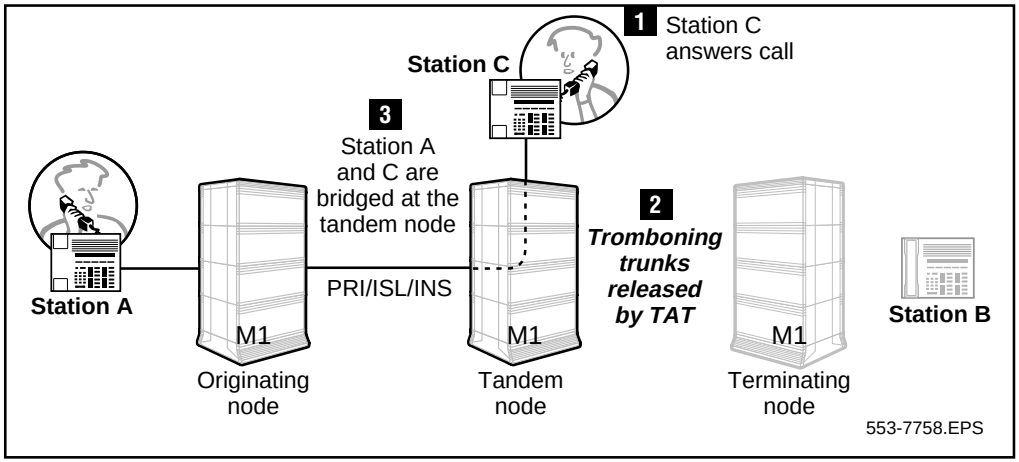
- Station A, on the originating node, calls Station B, on the terminating node, across a tandem node over a PRI/ISL/VNS trunk (first call);
- Station B is call forwarded or hunts over another PRI/ISL/VNS trunk, to Station C located on a tandem node (redirected call.) This causes tromboning between the terminating node and the tandem node.

Figure 177
Network Call Redirection before TAT



After Station C answers, antitromboning is invoked. This causes the tromboned trunks to be released. Station A and Station C are connected at the tandem node. The results of this antitromboning are shown in Figure 178.

Figure 178
Network Call Redirection after TAT



Radio Paging System

If an attendant originates a call which, through call modification or call redirection creates tromboned trunks, and eventually terminates on a Radio Paging equipment, TAT will not optimize the trunks. That is, TAT will not optimize tromboning PRI/ISL/VNS trunks resulting from an attendant initiating an outgoing trunk call.

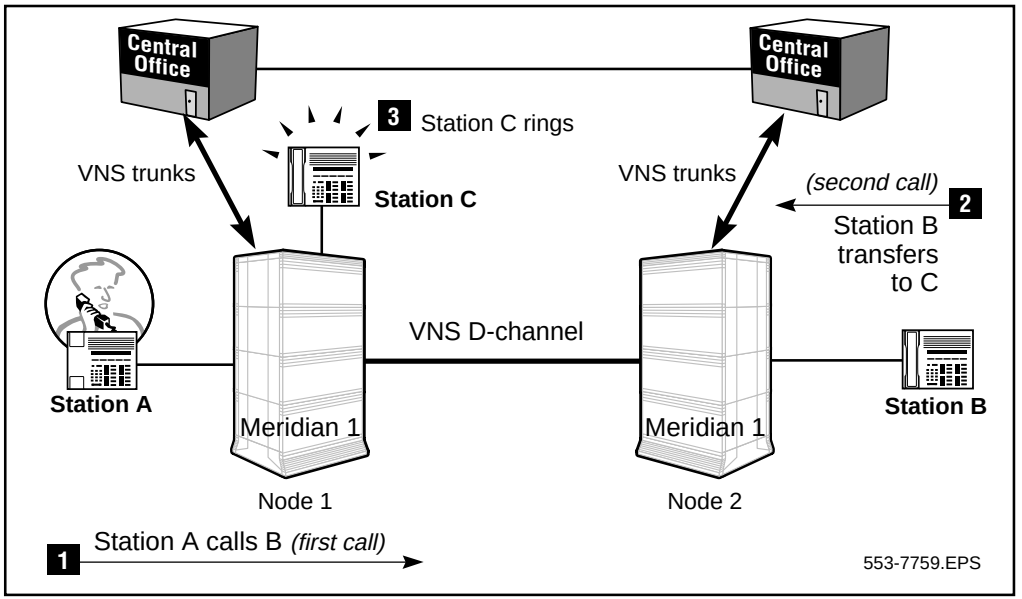
Trunk Route Optimization - Before Answer

See “Trunk Anti-Tromboning and Trunk Optimization - Before Answer both equipped on the same Meridian 1” on page 1593.

Virtual Network Services (VNS)

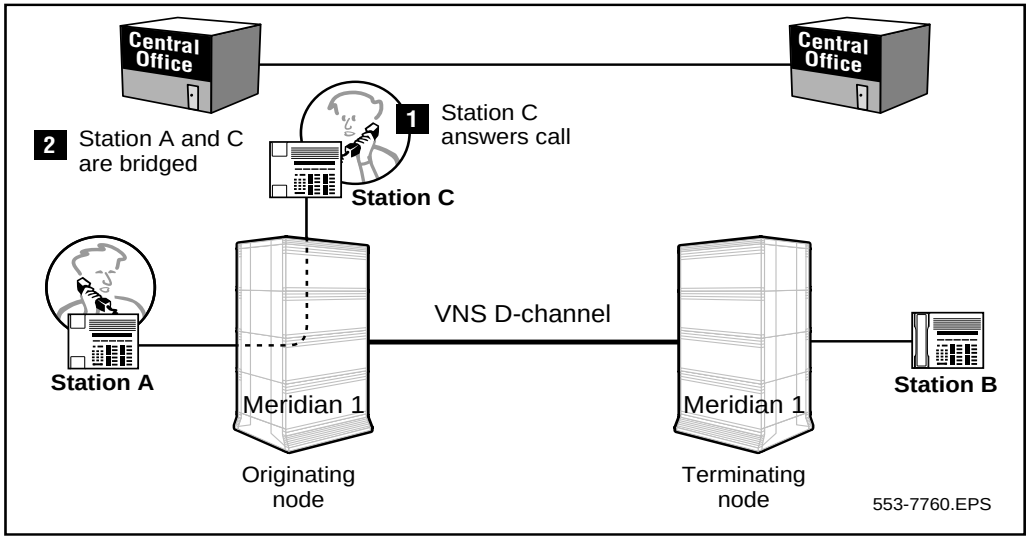
The Trunk Anti-Tromboning feature will perform antitromboning operations to eliminate tromboned trunks (physical B-channels) associated with the same VNS D-channel. For example, in Figure 179, Station A at the originating node calls Station B at the terminating node, over a VNS D-channel trunk. Station B transfers the call to Station C, also located at the originating node. The physical B-channel trunks associated with the D-channels are considered to be tromboned.

Figure 179
VNS before TAT



After Station C answers, the tromboned trunks are released, and Station A and Station C are bridged. Refer to Figure 180.

Figure 180
VNS after TAT



Feature packaging

The Trunk Anti-Tromboning feature introduces the Trunk Anti-Tromboning (TATO) package 312.

Additionally, the following packages are required:

- Integrated Services Digital Network (ISDN) package 145;
- Primary Rate Access (PRA) package 146; or
- Integrated Service Digital Network Signaling Link (ISL) package 147; or
- 2.0 Mb Primary Rate Interface (PRI2) package 154; and, optionally
- Advanced ISDN Network Services (NTWK) package 148;
- Multi-purpose Serial Data Link (MSDL) package 222;
- Trunk Anti-Tromboning (TATO) package 312.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 17 — Configure TAT functionality on the D-channel.

LD 17 — Configure TAT functionality on the D-channel.

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	ADAN	Type of change.
- ADAN		Action Device and Number.
	NEW DCH x CHG DCH x	Add D-channel x. Change D-channel x.
- CTYP		Card type.
	MSDL	MSDL = Multi-purpose Serial Data Link (for Options 51C, 61C, 81C.) MSDL = Downloadable D-channel for Option 11C.
- CDNO	1-10	For Option 11C only. The card number for the Downloadable D-channel.
- PORT	0-3 1	Port number on MSDL cards. Only port 1 is valid for the Option 11C.
...		
- IFC	SL1 S100 D100 D250	Interface type for D-channel. Either SL1, S100, D100, or D250 may be entered. Currently, SL1 and D250 are the only interfaces supported by TAT.
...		
- RLS	xx	Release ID of the switch at the far end of the D-channel. Release 21 or higher must be entered.
- RCAP	TAT	Remote Capabilities. TAT must be entered to enable Trunk Anti-Tromboning.

Feature operation

The Trunk Anti-Tromboning feature is transparent to the user, provided all datafills and hardware are assigned and equipped properly.

Trunk Optimization (Before Answer)

Contents

The following are the topics in this section:

Feature description 1623
Operating parameters 1625
Feature interactions 1627
Feature packaging 1628
Feature implementation 1629
Task summary list 1629
Feature operation 1629

Feature description

Trunk Optimization Before Answer (TRO-BA) enhances routing on PRI and ISL routes for redirected calls. Trunk Optimization Before Answer (TRO-BA) occurs when a direct call is made from the originating to the redirection telephone, between Meridian 1 systems.

Trunk Optimization Before Answer (TRO-BA) only operates when Network Call Redirection is also enabled on a Meridian 1.

TRO-BA applies to the following call redirections:

- Network Call Forward All Calls (NCFAC)
- Network Call Forward No Answer (NCFNA)
- Network Hunting (NHNT)

With supporting Network Call Redirection features enabled on each node, TRO-BA can work as explained in Case 1 and Case 2.

Case 1

The originating telephone A calls a remote telephone B over a PRI/ISL route (1), and due to Network Call Forward All Calls (NCFAC), Network Call Forward No Answer (NCFNA), or Network Hunting (NHNT), the call is forwarded to telephone C over route (2).

When TRO-BA is enabled at switch B, messages are sent from the redirecting node (B) to the originating node (A)with the following information:

- redirection number
- redirection reason
- redirection counter

If the originating node does not support Trunk Optimization, the node sends a message rejecting TRO-BA, and the call proceeds on the current route. The redirecting node then cancels TRO-BA routing.

If Node A has TRO-BA enabled, and has a first choice route member available, and the redirection counter does not exceed the limit, the system sends back a message accepting TRO-BA. The redirecting node sends a message to release the connection and the originating node sends a message confirming that the original connection (1) is dropped. The originating node also establishes a direct connection to Telephone C over route 3.

In this case, the switch routes 1 and 2 are available for additional calls.

Case 2

The originating telephone A calls remote telephone E over PRI/ISL routes (3 and 5), and due to Network Call Forward All Calls (NCFAC), Network Call Forward No Answer (NCFNA), or Network Hunting (NHNT), the call forwards to telephone C over a PRI/ISL route (5). When Node A accepts the TRO-BA request, node A establishes a direct connection to node C over route 3. In this case, both connections over route 5 are dropped and available for other calls.

Operating parameters

TRO-BA is only supported before the call is answered.

TRO-BA must be supported on all the nodes involved, by responding YES to the TRO prompt in the Route Data Block (RDB), LD16. Also, each telephone redirecting the call must have a Call Forwarding/Hunting feature allowed. The TRO-BA operation is not supported if the originating telephone and the redirection telephone reside on the same node.

Trunk routes targeted for optimization must be listed in the Route List Index (RLI entry 0).

Only ISDN PRI/ISL trunks are supported. If an analog or digital trunk (not controlled by a D-Channel) is used between the originating and redirecting node, TRO-BA does not operate. The call continues on the original path.

Trunk Optimization operates independently of the telephone type used for a call. TRO-BA works for both voice and data calls between Meridian 1 machines.

Only Meridian 1 to Meridian 1 connections are supported. Non-Meridian 1 switches can operate as tandem switches if they can send along the TRO-BA messages.

When the call is redirected, a two second timer begins within the redirecting system, waiting for a responding message from the originating node. If the timer expires, the call continues along the original path, and TRO-BA does not operate.

Carefully analyze traffic estimates for all routes targeted for TRO-BA to ensure that enough trunks and routes are available for all routing possibilities.

TRO-BA is not supported with mixed dialing plans. Use caution when implementing TRO-BA on a network using UDP and CDP at the same time. As location codes are not used between CDP locations, TRO-BA may direct calls to the wrong location. Duplicating CDP DNs at other TRO-BA locations may cause TRO-BA to redirect the call to the wrong DN.

Trunk Optimization **is not supported** for the following call types:

- DID trunk call at Node A goes to Telephone B (which is on Node B) and has NCFAC, NCFNA, NHNT to Telephone C.
- DID trunk call from Node A to Telephone A (that has NCFAC, NCFNA, and NHNT) to Telephone B (that has NFAC, NCFNA, and NHUNT) to Telephone C
- Telephone D calls Telephone B (which is NCFAC, NCFNA, and NHUNT) to Telephone C when Node D is connected by non-ISDN link to Node C.
- The attendant extends a DID or Incoming trunk call to Telephone B and releases, and Telephone B is CFNA to Telephone C. After three rings, the call is forwarded, but not optimized, to Telephone C.

  If the attendant remains with the call, TRO-BA functions.
- Telephone A uses Transfer or Conference to Telephone B when Telephone B has NCFAC, NHUNT, and NCFNA to Telephone C.
- Calls to Meridian Mail auto attendant functions are not optimized because the call is viewed as being answered.
- if redirecting the call increments the network redirection counter beyond the limits
- ACD Night Call Forward calls
- ACD Interflow calls

Feature interactions

With the exception of those discussed here, call redirection features are not affected or supported.

Attendant calls

Attendant extended calls can allow or restrict TRO-BA as shown in the following:

- Telephone A, a DID trunk, or an incoming trunk calls the attendant, and the attendant extends the call to Telephone B, which has NCFAC, NHUNT to Telephone C. The call is optimized to Telephone C.
- A DID trunk, or an incoming trunk call to the attendant is extended to Telephone B, and the attendant does not release the call. Telephone B has NCFNA to Telephone C. After three rings, the call forwards to Telephone C, and the attendant releases the call. The call is optimized to Telephone C.

BARS/NARS

BARS/NARS operation is not changed. BARS/NARS is used to determine route availability to terminate the optimized call. Only Uniform Dialing Plan (UDP) and Coordinated Dialing Plan (CDP) are supported by TRO-BA. Direct Trunk Access Codes are not supported.

Call Party Name Display

When a call is optimized, the name or number may not appear on the receiving party's display.

Class of Service

It is important to program redirecting telephones with Class of Service (CLS) to allow call redirection.

Dialed number display

Calls modified by Network Call Redirection and TRO-BA may affect the display results on the answering telephone. The dialed number/name will not appear on the called telephone's display, despite having it allowed.

EuroISDN Trunk - Network Side

Trunk Optimization is not supported across a EuroISDN Trunk - Network Side interface. Trunk Optimization Before Answer is not supported within an MCDN network, if the call originated from a EuroISDN Trunk - Network Side connectivity interface.

Network Call Forward by Call Type (NCFCT)

For calls containing CLID in the setup message, the RCLS prompt is superseded by the numbering plan type identified within the setup message. Incoming trunk calls answered at node A, prior to entering the TIE trunk link using call modification, contain a CLID as a result of the call modification and may result in Internal call treatment at the terminating node.

Refer to the Network Call Redirection discussion in this document. Be sure to consider this feature when configuring your network.

Network Call Redirection (NCFAC, NCFNA, NHNT)

TRO-BA depends on Network Call Redirection (NCRD) messages over the D-channel. Be sure to allow NCRD for all routes targeted for TRO-BA calls. When a call is redirected using TRO-BA, the redirection information is passed to the originating node, the redirection is suspended, and a direct connection is established. If a route is not available when the call is placed, the call may be blocked.

Network Call Transfer

Trunk Optimization does not operate for Network Call Transferred calls. Station and attendant extended calls do not utilize TRO-BA.

Network Message Service

TRO-BA occurs when Meridian Mail Call Sender is activated. No optimization takes place when through dialing or operator revert features are used, because the calling DN is not provided to Meridian Mail with these features. When a call is optimized, the original called party information is included in the setup message of the call. This is the way Meridian Mail determines the intended receiver.

Feature packaging

TRO-BA is packaged as an ISDN feature in Advanced Network Services (NTWK) package 148.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 16 – Configure Trunk Optimization

LD 16 – Configure Trunk Optimization

Prompt	Response	Description
REQ	CHG	Change.
TYPE	RDB	Route Data Block.
CUST	xx	Customer number.
ROUT	xx	Route number.
DTRK	(NO) YES	Digital Trunk Route Must be YES to prompt ISDN.
ISDN	(NO) YES	ISDN option.
NCRD	(NO) YES	Network Call Redirection. Allows network call redirection messages to be sent (or blocks messages if NCRD =no). Must be Yes to prompt TRO.
TRO	(NO) YES	Trunk Optimization.

Feature operation

There are no operating procedures specified for this feature.

Trunk to Trunk Connection

The Trunk to Trunk Connection feature introduces the following capabilities:

- transfer on ringing of external trunk across the network
- transfer of one supervised outgoing external trunk to another
- conference of external trunks
- outgoing trunk to trunk charging

These capabilities are available on an analog (500/2500 type) set, Meridian 1 proprietary set or an Attendant Console.

Please refer to the *Features and Services* (553-3001-306) guide for complete information.

Virtual Network Services Virtual Directory Number Expansion

Contents

The following are the topics in this section:

Feature description 1633
Operating parameters 1634
Feature interactions 1634
Feature packaging 1634
Feature implementation 1635
Task summary list 1635
Feature operation 1639

Feature description

Virtual Network Services (VNS) provides ISDN features to customers when no ISDN Primary Rate Interface (PRI) or ISDN Signaling Link (ISL) Bearer Channels are available between two Meridian 1 switches. (Refer to the VNS feature description module in this NTP for detailed information on VNS).

You must configure VNS DNs (VDNs) as part of the numbering plan. The VNS VDN expansion feature sets a new limit on the number of VDNs at 4000. VDNs are configured on Overlay 79.

The VDNs are defined in sets of blocks. Each block may contain any number of contiguous VDNs, as long as the total number does not exceed 4000. Within a block, it is possible to define a range of VDNs as well as individual VDNs.

For example, a customer may define the following VDNs (In this example, the customer is defining a total of 164 VDNs.)

7200-7299
7320-7325
7355
7400-7455
7676

A customer may remove a block of contiguous VDNs, as long as there is no VNS call using a VDN in the block. To remove a block of contiguous VDNs, the block has to be first disabled in Overlay 79 (by entering DIS against the REQ prompt), to prevent new VNS calls from using any of the VDNs in the block. Once the block has been disabled, the system administrator has to wait until all the VNS calls, using any of the VDNs in the block, are cleared.

After disabling the block, the system administrator can determine the number of VDNs used by VNS calls by printing VNS information (by using the PRT command in response to REQ in Overlay 79). Once all of the VDNs are free, the block may be removed by using the OUT command.

Operating parameters

There are no operating parameters specified for this feature.

Feature interactions

There are no feature interactions specified for this feature.

Feature packaging

The VNS VDN expansion feature requires the following packages:

- Virtual Network Services (VNS) package 183;

The following software packages are also required:

- Network Alternate Route Selection (NARS) package 58, dependent on:
  - — Basic Routing (BRTE) package 14, and
  - — Network Class of Service (NCOS) package 32;
- Integrated Services Digital Network (ISDN) package 145;
- ISDN Signaling Link (ISL) package 147;

- Advanced Network Services (NTWK) package 148;
- Integrated Services Digital Network Supplementary (ISDN INTL SUP) package 161; and
- Primary Rate Access (PRI) package 146, or 2.0 Mbit PRI (PRI2) package 154, is required if VNS uses the D-Channel of a PRI or PRI2 trunk for its signaling (USR = SHAV).

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 17 – Define the maximum number of VNS channels supported by a D-Channel.

2 LD 79 – Add or create a new single VDN or a block of contiguous VDNs.

3 LD 79 – Remove a single VDN or a block of contiguous VDNs, or remove all existing VDN data blocks.

4 LD 79 – Disable or enable single VDN, or a block of contiguous VDNs.

5 LD 79 – Print VNS information for a customer.

6 LD 86 – Define the maximum number of VNS trunks allowed on the route list entry.

The following steps describe how to:

- Add or create a new single VDN or a block of contiguous VDNs;
- Remove a single VDN or a block of contiguous VDNs; and
- Disable or enable a block of VDNs, or print VNS information for a customer.

LD 17 – Define the maximum number of VNS channels supported by a D-Channel.

Prompt	Response	Description
REQ	CHG END	Change, or exit LD 17.
TYPE	ADAN	Action Device and Number.

- ADAN	CHG DCH 0-63	The D-channel number for Options 51C, 61C, 81C.
	CHG DCH 0-15	For Option 11C.
...		
- USR	VNS SHAV	VNS = dedicated VNS D-Channel SHAV = shared VNS D-Channel
...		
- - VNSM	1-300	Maximum number of VNS channels supported by the D-channel. ***Note:*** This is the potential VNS capability for the D-channel and is not associated with other restrictions placed on VNS capability, such as the number of VDNs.

LD 79 – Add or create a new single VDN or a block of contiguous VDNs.

Prompt	**Response**	**Description**
REQ	NEW	Add, or create a new single VDN or a block of contiguous VDNs. ***Note:*** The CHG command is not supported; you must use the NEW command to enter information.
TYPE	VNS	Virtual Network Services.
CUST	xx	Customer number. At least one D-Channel must be configured with USR = VNS or USR=SHAV and having VNS = Customer number.
VNDN	xx...x 1-4000 xx...x	Individual VDN to be added. 1-4000 = number of contiguous VDN to be added xx...x = first VDN to be added.
	<CR>	You may add another single VDN or a block of contiguous VDNs by entering <cr> after the VNDN entry (VNDN is prompted until <cr> is entered.) In this case, the REQ prompt will appear again. ***Note:*** For the above entries, the VDNs must be part of the customer's numbering plan.

LD 79 – Remove a single VDN or a block of contiguous VDNs, or remove all existing VDN data blocks.

Prompt	Response	Description
REQ	OUT	Remove a single VDN or a block of contiguous VDNs, or remove all existing VDN data blocks. ***Note:*** You cannot remove only certain VDNs from a block; you must remove the entire block.
TYPE	VNS	Virtual Network Services.
CUST	xx	Customer number. At least one D-Channel must be configured with USR = VNS or USR = SHAV and having VNS = Customer number.
VNDN	XALLVDNS xx...x	Remove all VNS data blocks. Remove an individual VDN, or the first VDN of a block of contiguous VDNs.
	<CR>	You may remove another single VDN, or a block of contiguous VDNs, by entering <cr> after the VNDN entry (VNDN is prompted until <cr> is entered.) In this case, the REQ prompt will appear again. If XALLVDNS is entered, the message REMOVE ALL VDN BLOCKS? is then output, followed by the CONF prompt.
CONF	YES	To confirm the removal of all VDN blocks.

LD 79 – Disable or enable single VDN, or a block of contiguous VDNs.

Prompt	Response	Description
REQ	DIS ENL	Disable a single VDN or a block of contiguous VDNs Enable a single VDN or a block of contiguous VDNs
TYPE	VNS	Virtual Network Services.
CUST	xx	Customer number. At least one D-Channel must be configured with USR = VNS or USR = SHAV and having VNS = Customer number.

VNDN	xx....x	Individual VDN, or first VDN of a block of contiguous VDNs to be disabled or enabled.
	<CR>	You may enable or disable another single VDN or a block of contiguous VDNs, by entering <CR> after the VNDN entry (VNDN is prompted until <CR> is entered.) In this case, the REQ prompt will appear again.

LD 79 – Print VNS information for a customer.

The information is output after the customer number is entered in response to the CUST prompt.

Prompt	Response	Description
REQ	PRT	PRT = print VDN information.
TYPE	VNS	Virtual Network Services.
CUST	xx	Customer number. At least one D-Channel must be configured with USR = VNS or USR = SHAV and having VNS = Customer number. The VNS information is output for the customer. For a range of VDNs, the first VDN is displayed, followed by "—" and the last VDN of the block. On the same line, the number of VDNs in the block is displayed in brackets. For a single VDN, the VDN is displayed followed by "(1)". If a block is disabled, the above indication is followed by the number of VNS calls still using a VDN in the block. These calls have to be cleared before the VDN block can be removed. At the end, the total number of VDNs configured for the customer is output.

		A sample output could be: 7676 (1) 8100—8199 (100) TOTAL NUMBER OF VDN FOR CUST 2: 101 If the VDN block 8100-8199, containing 100 VDNs, is disabled, the output would be: 7676 (1) 8100—8199 (100) *DISABLED - VDN USED: 2* TOTAL NUMBER OF VDN FOR CUST 2: 101 In this case, the VDN block is disabled and two VNS calls are still using two VDNs. These two calls must first be cleared before the VDN block 8100-8199 can be removed.

LD 86 – Define the maximum number of VNS trunks allowed on the route list entry.

Prompt	Response	Description
REQ	NEW CHG	New, or change.
CUST	xx	Customer number.
FEAT	RLB	Route list data block feature.
RLI	0-MXRL	The Route List Index to be associated with the VNS Bearer Channel.
ENTR	0-63	The entry within the Route List Index to be associated with the VNS Bearer Channel.
ROUT	0-511	The number of the Route to be associated with the VNS Bearer Channel.
VNS	YES	Virtual Network Services.
...		
VTRK	1-(20)-254	Number of VNS Trunks allowed on the route.

Feature operation

There are no operating procedures specified for this feature.

Virtual Network Services

Contents

The following are the topics in this section:

Feature description 1641
Operating parameters 1647
Feature interactions 1649
Feature packaging 1660
Feature implementation 1660
Task summary list 1660
Feature operation 1666

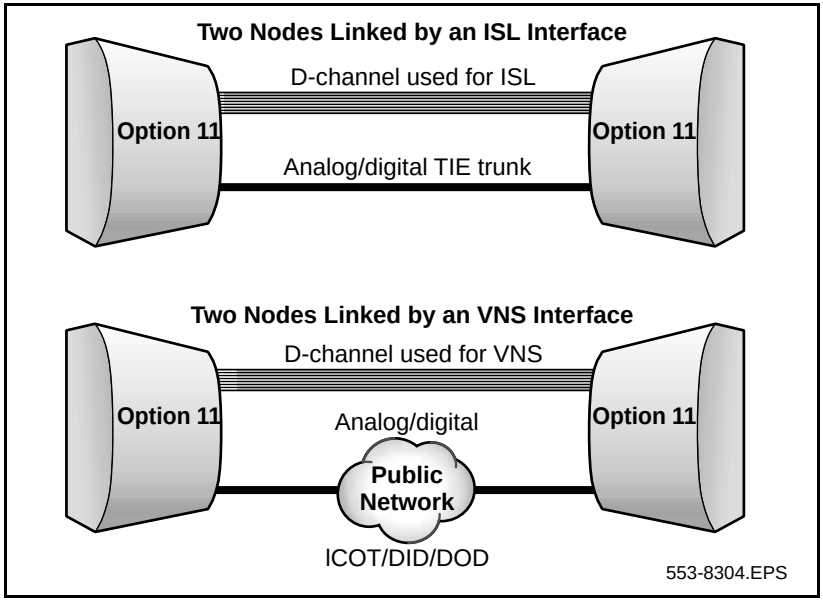
Feature description

The Virtual Network Services (VNS) feature offers a means to use Meridian 1 Integrated Services Digital Network (ISDN) networking features when two Meridian 1 systems are linked by a D-channel and an available Public Switched Telephone Network (PSTN) trunk exists. The PSTN trunks in this configuration serve as the B-channel for the call's duration.

VNS is an enhancement of the ISDN Signaling Link (ISL) interface. The enhancement allows the voice and the signaling of a call to take different physical paths. In the case of an ISL call, the D-channel is used for signaling, whereas the voice/data uses a TIE trunk (Meridian 1 to Meridian 1 connection only). The VNS feature extends the number of trunk types supported for the voice path by including the possibility of using different public trunks (e.g., COT, DID, DOD).

Figure 181 depicts the difference between two nodes linked by an ISL interface and two nodes linked using VNS.

Figure 181
VNS Interface/ISL Interface Comparison



Similar to the case of an ISL interface, the D-channel used for VNS can be shared with the D-channel of a Primary Rate Interface (PRI) that links two Meridian 1 switches, or it can use a D-channel that communicates with the far end through a pair of dedicated line modems, dial-up modems, or Meridian 1 data adapters.

When the D-channel used by VNS is on a PRI, the D-channel mode is defined as USR = SHAV, in LD 17, meaning that VNS, ISL and ISDN PRI calls can share this D-channel. In the other situation, the D-channel is defined as USR = VNS in LD 17 which allows ISL, and VNS calls to use this D-channel for signaling.

The following types of trunks and connectivities can be used for VNS calls:

— PRI trunks with:
Meridian Customer Defined Network (MCDN) connectivity.

- PRI2 trunks with:
  AXE10, NUMERIS, SwissNet 2, 1TR6, and Meridian Customer Defined Network (MCDN) connectivity.
- Analog trunks with:
  disconnect supervision.

— 1.5 Mb Digital Trunk Interface (DTI) trunks with:
Digitone Signaling (DTN), or Dial Pulse Signaling (DIP) connectivity.

- 2.0 Mb Digital Trunk Interface (DTI2) trunks with:
  Multifrequency Compelled Signaling (MFC), Digitone Signaling (DTN), or Dial Pulse Signaling (DIP) connectivity.
- EuroISDN and QSIG trunks with:
  PRI and Basic Rate Interface (BRI).
- Digital Private Network Signalling System No.1 (DPNSS1) or Digital Access Signalling System No.2 (DASS2) trunks.

All of these trunks are being referenced throughout this document as the VNS Bearers, or simply the Bearer trunks.

Although the VNS feature can use Central Office Trunks (COT), Direct Outward Dialing (DOD), and Direct Inward Dialing (DID) trunks to link two Meridian 1 nodes, VNS calls are presented, handled, and interact with other features as though private ISDN TIE trunks are used for that purpose. The exceptions that apply are stated in the “Feature interactions” section.

Note that TIE trunks can also be used with VNS. When this is the case, the connection does not necessarily need to be a direct Meridian 1 to Meridian 1 connection (e.g., when QSIG is used).

Speechpath availability

When extending a call to a Remote node, the attendant relies on the tones and lamp states to determine if it is possible to extend a call, camp-on a busy extension, break-in to a conversation, etc.

When using a VNS Bearer trunk, the tones can be those of the PSTN (especially for “intelligent” trunks such as ISDN connectivity). For example, when extending a call to a busy set over an ISDN PSTN Bearer, the attendant hears busy tone (from the PSTN) instead of silence.

If Attendant Console operation has to remain the same with VNS, an answer signal has to be sent right away to the PSTN for attendant extended calls, whatever the state of the terminating party. This allows the attendant to hear the tones coming from the terminating Meridian 1 node, instead of tones from the PSTN.

The prompt VRAT exists for the incoming Bearer route (LD 16) to allow or disallow automatic answering of attendant extended calls. The Network Attendant Service (NAS) feature must be configured to provide this functionality.

When a route is configured with VRAT = YES, tones are similar to those provided on a private Meridian 1 ISDN PRI network; however, some unanswered calls may be charged. If a route is configured with the default value (VRAT = NO), tones heard when extending a call from the attendant might be different than the ones provided over a private Meridian 1 ISDN network. Users are not charged for unanswered calls.

PSTN clearing of unanswered calls

In some countries, a PSTN call left unanswered is disconnected after a few minutes, in order to reduce the usage of equipment that has not been paid for. This creates a major difference between private networks using TIE lines and private networks using VNS. For example, with VNS a call left in a camp-on state would be cleared by the public network after several minutes.

The VNS Set Speechpath (VSS) timer of the incoming Bearer route (LD 16) can be configured to avoid this situation. It defines the interval after which an answer signal is sent from the terminating Meridian 1 node to the Public Exchange/Central Office.

The configuration of the VSS timer has an impact on the cost of the calls, because the public network starts charging upon the reception of the answer signal.

Numbering Plan

A requirement of VNS is that customers have to configure VNS DNs (VDNs) as part of their numbering plan. The VNS VDN expansion feature sets a new limit on the number of VDNs at 4000. VDNs are configured on Overlay 79.

The VDNs are defined in sets of blocks. Each block may contain any number of contiguous VDNs, as long as the total number does not exceed 4000. Within a block, it is possible to define a range of VDNs as well as individual VDNs. For example, a customer may define the following VDNs (in this example, the customer is defining a total of 164 VDNs.)

7200-7299
7320-7325
7355
7400-7455
7676

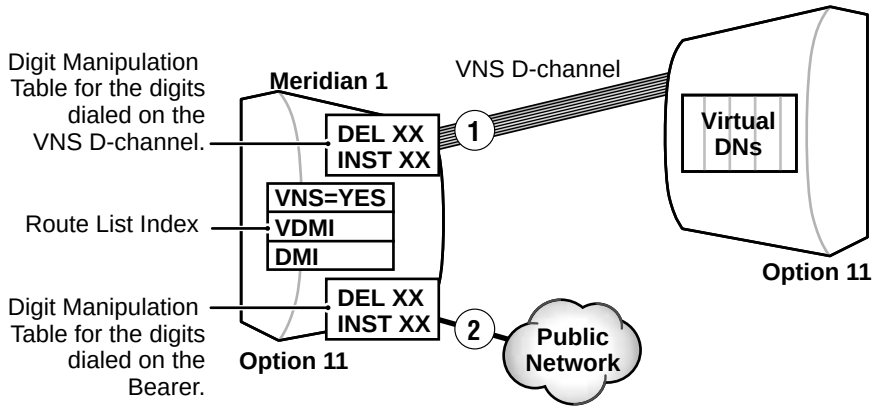
A customer may remove a block of contiguous VDNs, as long as there is no VNS call using a VDN in the block. To remove a block of contiguous VDNs, the block has to be first disabled in Overlay 79 (by entering DIS against the REQ prompt), to prevent new VNS calls from using any of the VDNs in the block. Once the block has been disabled, the system administrator has to wait until all the VNS calls, using any of the VDNs in the block, are cleared.

The system administrator can determine the number of VDNs used by VNS calls, by printing VNS information using the PRT command in response to the REQ prompt in Overlay 79 (note that the block of VDNs must be first disabled.) Once all of the VDNs are free (unused), the block of VDNs may be removed by using the OUT command.

An Electronic Switched Network (ESN) call is identified as being VNS once a valid entry configured when the prompt VNS = YES has been found in a Route List Block (LD 86) used for the digits dialed. A SETUP message is sent to the terminating node on the VNS D-channel. Manipulation of the digits included in the SETUP message is performed, if needed, using the digits dialed and according to the content of the Digit Manipulation Table referenced with the prompt VDMI.

On reception of the SETUP request, the terminating node sends one of its Virtual DNs back to the originating node. The terminating node expects to receive a call for that Directory Number (VDN) from one of its trunks linked to the public network. The originating node, upon reception of the VDN, seizes a trunk and dials a number consisting of the VNS Virtual DN affected by the manipulations defined in the Digit Manipulation Table referenced by the prompt DMI. These manipulations are performed in order to dial the Virtual DN through the public network to the destination node.

Figure 182
Digit Manipulation



1 The digits dialed by the originator of the call might be changed by the Digit Manipulation Table identified by the prompt VDMI, in order to appear differently in the SETUP message sent on the the VNS D-channel. This message contains the digits of the destination party on the terminating node.

2 The Virtual DN received from the terminating node might be changed by the Digit Manipulation Table identified by the DMI prompt. The VNS feature dials this number through the public network terminating node.

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Failure of VNS D-channel

If the D-channel is not operable, the VNS route list entry is chosen, and then this entry is bypassed. In a network VNS environment, calls will remain queued at the source node.

If the VNS D-channel fails when a call is established, the call remains established. This is, however, without the ability to use the networking features normally supported by the VNS feature.

Failure of Bearer

Failure of the VNS Bearer trunk results in the VNS call being cleared.

Operating parameters

VNS requires a contiguous block of existing unused DNs (virtual DNs) at both the originating and the terminating nodes, which are a subset of the DID range of the customer. VNS virtual DNs can be up to seven digits long. A maximum of 100 virtual DNs can be assigned per customer.

VNS D-channel

VNS requires an established D-channel between the originating and terminating nodes for signaling. No intermediate nodes are permitted.

A VNS D-channel belongs to only one customer and cannot be shared by other customers for VNS calls.

VNS does not support Backup D-channels for VNS signaling.

D-channels provided by Basic Rate Interface (BRI) are not supported as VNS D-channels.

VNS reverts back to conventional signaling if the VNS D-channel fails.

VNS Bearer Trunks

Disconnect supervision is mandatory for all trunks, while answer supervision is not. In cases when it is not available, VNS will assume that the Bearer is answered as soon as the “end-of-dialing” timer has expired.

The following trunks are not supported as VNS Bearer trunks:

- Autoterminate trunks;
- Analog Private Networking Signalling System (APNSS); and
- Basic Rate Interface trunks (used for NUMERIS, 1TR6 or MCDN).

The following signaling systems are not supported for VNS:

- Japan D70; and
- Multifrequency Extended Signaling for Socotel (MFE).

Any Incoming Digit Conversion on the incoming VNS Bearer trunk causes a VNS call to fail.

Data calls are supported only if the Bearer supports data calls.

Maximum number of VNS calls

Different elements control the maximum number of simultaneous VNS calls that can be processed by a Meridian 1 system. The number depends on the resources allocated for the VNS feature itself, the resources to be used for the voice path (Bearer trunks) and the resources available for VNS signaling over the D-channel.

For each customer

It is not possible to perform more VNS calls (incoming and outgoing) than the number of Virtual DNs defined for the customer in LD 79.

The number of VNS calls is limited by the number of available Bearer trunks. When all Bearers defined to be usable with VNS are busy, no other VNS calls can be made.

For each D-channel of the customer

The maximum number of VNS calls allowed to use a D-channel is limited by the value defined to the D-channel by the VNSM prompt in LD 17.

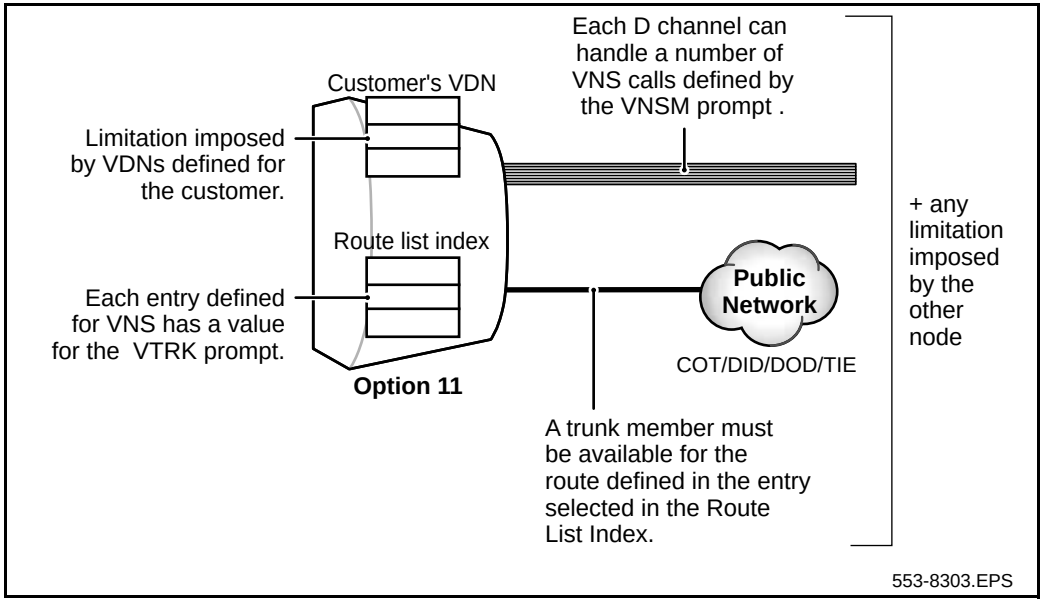
For each entry in a Route List Block

The maximum number of VNS calls that can be performed on a route listed in an entry of a Route List Block in LD 86 is limited by the value entered in response to the VTRK prompt.

On a network level

In the case of a non-symmetrical configuration between originating and terminating VNS nodes, the call limitation imposed by the more restrictive node applies.

Figure 183
VNS Call Limitations


Each D channel can handle a number of VNS calls defined by the VNSM prompt .
Customer's VDN
Limitation imposed by VDNs defined for the customer.
Route list index
Each entry defined for VNS has a value for the VTRK prompt.
Option 11
Public Network
COT/DID/DOD/TIE
+ any limitation imposed by the other node
A trunk member must be available for the route defined in the entry selected in the Route List Index.
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Feature interactions

The following features are supported over VNS routes:

- Attendant Barge-In
- Attendant Break-In
- Attendant Recall with Splitting
- Basic Authorization Code
- Basic Rate Interface/Primary Rate Interface Interworking
- Calling Party Number
- Call Party Name Display
- Call Selection (ICI + loop)
- Console Digit Display
- Control of Trunk Group Access

- Digit Display
- Display of Calling Party Denied
- Electronic Lock Network Wide/Electronic Lock on Private Lines
- Network Attendant Service
- Network Call Redirection
- Network Class of Service
- Network Flexible Feature Codes
- Network Message Center
- Network Message Service to Meridian Mail
- Network Ring Again
- Network Ring Again No Answer
- Originator Routing Calls
- Radio Paging
- Trunk Optimization Before Answer

In addition, VNS has interactions with the following features:

Access Restriction

When a user has trunk access barred (i.e, via Trunk Group Access Restriction (TGAR), New Flexible Call Restriction (NFCR), or Toll Denied Class of Service), the user will still be able to make a VNS call.

If a customer wants users to be toll restricted even for VNS calls, the Minimum Facility Restriction Level (FRL) in the Route List Block (i.e., LD 86) can be used.

Analog Private Networking Signalling System (APNSS)

APNSS trunks cannot function as VNS Bearer trunks.

Attendant Call

When an attendant extends a call over a VNS network, it is not possible to release the call before the status of the destination is known. This applies regardless of Network Attendant Service (NAS) configuration.

Autoterminate

Autotermination on VNS Bearer trunks is not supported, because a VNS Virtual DN is expected on a VNS Bearer exactly the way it was passed back on the VNS D-channel.

Call Detail Recording (CDR)

Call Detail Recording is supported on VNS routes with the exception of the 911 CDR Improvement and Meridian 911 ANI in CDR features. The CDR output is controlled by the Bearer trunk (i.e., CDR output defines the details of the call made on the Bearer, and not the VNS D-channel). The Calling Line Identity will be output in the CDR record for incoming calls.

Call Pickup Network- Wide

The Call Pickup Network Wide feature will not work in conjunction with the Virtual Network Services feature.

Calling Line Identification

Calling Line Identification is supported on VNS routes. All display information is taken from messages on the VNS D-channel. The VNS Bearer does not drive the display of such information.

Charge Display at End of Call

In the case of VNS calls, no charge information is displayed.

Data Calls

Data calls are supported on DPNSS1 or DASS2 VNS Bearer trunks if the DPNSS1 or DASS2 VNS Bearer trunks are configured to support data calls. Similarly, data calls are supported on DPNSS1 or DASS2 Bearer trunks in VNS to DPNNS1/DASS2 gateways, if the DPNSS1 or DASS2 VNS Bearer trunks are configured to support data calls.

Digital Trunk Interface (DTI) – Commonwealth of Independent States (CIS)

Virtual Network Services via CIS DTI2 is not supported.

Direct Inward Dialing (DID) Treatment

Since VNS is handling calls as though they were made using ISDN TIE trunks even when VNS DID Bearer trunks are used, the VNS feature does not adhere to the special treatment given to regular DID trunks.

Distinctive Ringing

Except in the case of Network Distinctive Ringing, the Distinctive Ringing feature is not supported by VNS. An incoming call using VNS on a Bearer trunk defined with the prompt DRNG = YES will ignore this value and will perform the same treatment as though the value was DRNG = NO (i.e., no distinctive ringing provided).

DPNSS1 Attendant Call Offer

DPNSS1 Attendant Call Offer is not supported over VNS Bearer trunks (DPNSS1 Attendant Call Offer allows an attendant-extended call, routed over a DPNSS1 trunk, to be camped-on to a remote busy extension.) Standard ISDN Camp-on may be provided instead, if NAS is configured over the VNS Bearer trunks.

DPNSS1 Attendant Timed Reminder Recall and Attendant Three-Party Service

DPNSS1 Attendant Timed Reminder Recall and Attendant Three-Party Service are not supported over VNS Bearer trunks. If NAS is configured over the VNS Bearer trunks, NAS call extension and Attendant Recall will be offered instead.

DPNSS1 Call Back When Free and Call Back When Next Used

DPNSS1 Call Back When Free and Call Back When Next Used are not supported over VNS Bearer trunks. Network Ring Again or Network Ring Again on No Answer may be provided instead, if Network Ring Again or Network Ring Again on No Answer are configured over the VNS Bearer trunks.

DPNSS1 Diversion

DPNSS1 Diversion is not supported over VNS Bearer trunks. Network Call Redirection and Trunk Route Optimization can be provided instead, if configured over the VNS D-Channel.

DPNSS1 Extension Three-Party Service

DPNSS1 Extension Three-Party Service is not supported over VNS Bearer trunks. Network Call Redirection and Trunk Route Optimization can be provided instead, if configured over the VNS D-Channels.

DPNSS1 Loop Avoidance

DPNSS1 Loop Avoidance is not supported over VNS Bearer trunks (DPNSS1 Loop Avoidance prevents a call from being looped through a DPNSS1 network by placing a limit on the number of channels that a call can use.) The ISDN Call Connection Limitation is provided, if it is configured over the VNS D-Channel.

DPNSS1 Route Optimization

DPNSS1 Route Optimization is not supported over VNS Bearer trunks.

DPNSS1 Route Optimization/ISDN Trunk Anti-Tromboning Interworking

ISDN Trunk Anti-Tromboning may be applied to the VNS part of the call, if configured on the VNNS D-Channel.

DPNSS1 Route Optimisation/MCDN Trunk Anti-Tromboning Interworking

The Route Optimisation/Trunk Anti-Tromboning Interworking feature is not supported over VNS trunks, since VNS uses only MCDN signaling. DPNSS1 is not supported.

DPNSS1 Step Back On Congestion

DPNSS1 Step Back On Congestion handles high traffic situations when congestion is encountered by DPNSS1 trunks. The following scenarios apply for interworking with VNS.

Homogeneous Networks

DPNSS1 Step Back On Congestion is supported over VNS Bearer trunks, if all the transit nodes within the DPNSS1 network used for VNS are configured accordingly:

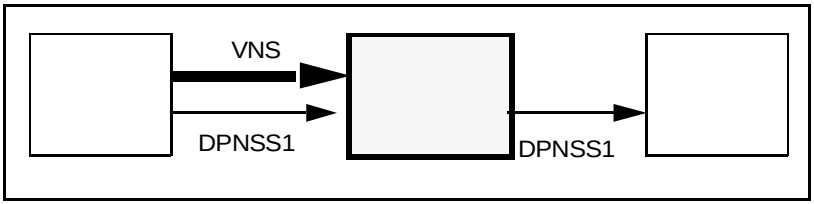
- In LD 86, if the SBOC (Step Back On Congestion) prompt is set to NRR (No Reroute) or RRO (Reroute Originator), then it would be sufficient that the VNS originating node be configured with either RRO (Reroute Originator) or RRA (Reroute All).
- In LD 86, if the SBOC (Step Back On Congestion) prompt is set to RRA (Reroute All) for a transit node, then the different alternative routes at this node must be configured with VNS and must be configured as VNS Bearers.

Hybrid Networks

MCDN/VNS with DPNSS1 node

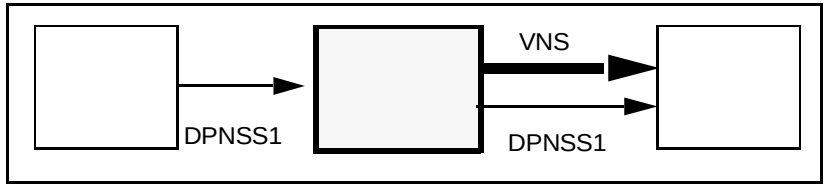
- If a congestion is encountered inside the VNS portion of the path, the node behaves as an MCDN/MCDN tandem. The ISDN Drop Back Busy (IDBB) and ISDN Off-Hook Queuing (IOHQ) are transmitted, so that they may applied further along the VNS portion of the path, or at the tandem node.
- If a congestion is encountered within the DPNSS1 network, the VNS portion of the call is cleared and the disconnection is propagated back to the originating side of the MCDN path. Neither Drop Back Busy nor Off-Hook Queuing is activated at the tandem node, even if IDBB or IOHQ are activated.

VNS with DPNSS1/DPNSS1 node



This scenario is considered as an MCDN/DPNSS1 gateway. The functionality is the same as for the Step Back on Congestion feature, as documented in the *DPNSS1 Product Information Guide* (553-3921-100.)

DPNSS1/VNS with DPNSS1 node

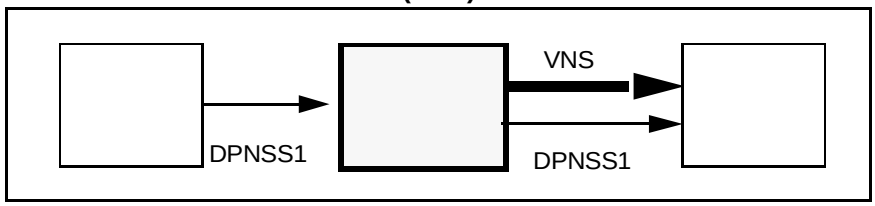


- If a congestion is encountered inside the VNS portion of the path, the VNS portion of the call is cleared and the disconnection is propagated back to the originating DPNSS1 side. The Step Back on Congestion feature is invoked, if it is configured.
- If a congestion is encountered the within the DPNSS1 portion of the path, with the DPNSS1 trunk being used as a VNS Bearer, the VNS portion of the call is cleared and a normal disconnection is propagated back to the originating DPNSS1 side. The Step Back on Congestion feature is not invoked, even if it is configured.
- Refer to "Network Attendant Service (NAS)" on page 1655 for information on the interaction with NAS in a similar scenario.

DPNSS1 Executive Intrusion

DPNSS1 Extension Three-Party Service is not supported over VNS Bearer trunks. Attendant Break-in may be provided instead, if NAS is configured over the VNS Bearer trunks.

Network Attendant Service (NAS)



- NAS calls being routed over the DPNSS1 network used as VNS Bearer will get dropped if there is congestion in the bearer call setup. NAS DBK (drop back) will not occur even if it is configured.

Stand-alone Meridian Mail

Stand-alone Meridian Mail is not supported over VNS Bearer trunks. A mailbox user may access Meridian Mail, if the ISDN Network Message Services is configured.

DPNSS1 Enhancements for ISDN Interworking

Enhancements allow DPNSS1 to interwork with QSIG and EuroISDN. At an ISDN gateway, ISDN information may carried into some DPNSS1 messages, if DPNSS_189I package 284 is equipped.

DPNSS1/DASS2 to ISDN PRI Gateway

A VNS call over a DPNSS1 or DASS2 Bearer trunk of an DPNSS1/DASS2 to ISDN PRI Gateway acts as the ISDN leg of the Gateway.

Electronic Switched Network (ESN)

The following ESN features are supported on VNS routes:

- ESN Basic Automatic Route Selection
- ESN Coordinated Dialing Plan Routing Enhancement
- ESN Coordinated Dialing Plan
- ESN (999 Loc.)
- ESN Flexible Numbering Plan
- ESN Free Calling Area Screening
- ESN Incoming Trunk Group Exclusion
- ESN Network Authorization Code
- ESN Network Automatic Route Selection
- ESN Network Routing Controls (Time-of-day Scheduling)
- ESN Network Speed Call
- ESN Tone Detection, and
- ESN Off-Hook Queuing.

EuroISDN Continuation

A EuroISDN link can be used as a B-Channel for the Virtual Network Services feature.

EuroISDN Trunk - Network Side

Virtual Network Services is supported on a EuroISDN Trunk - Network Side connectivity, meaning that a EuroISDN Trunk - Network Side trunk can be used as a VNS bearer trunk.

Incoming Digit Conversion

Since VNS Virtual DNs must be received on the incoming VNS Bearer (DID) trunks, as they are defined at the terminating node, the VNS feature is not supported for routes that perform digit conversion on the digits used for VNS Virtual DNs.

ISDN Call Connection Limitation (ICCL) Checks

The VNS trunk from the external network looks exactly like an ISDN TIE trunk and accordingly is subject to ICCL checks and call restrictions applied thereon.

ISDN PRI/BRI Meridian 1 to Asia Pacific Connectivity

It is not possible to configure an Asia Pacific D-channel as a VNS D-channel. However, the voice connection through the Public Exchange of a VNS call may use a PRI/BRI COT or DID as a virtual TIE trunk.

ISDN QSIG Basic Call

A QSIG link can be used as a B-channel for the Virtual Network Service (VNS) over a private network. All VNS services are supported as normal. QSIG is only used as a speech bearer.

Intercept Treatment

Intercept treatment applied to VNS calls is configured as for TIE trunks.

Network ACD

Network ACD (NACD) is supported by VNS. When a call queued at a source node receives notification that an agent is free and reserved at the target node, a VNS call is made to the target node. At that time, the call is removed from the queue at the source node. The call will continue to receive ringback (or Recorded Announcement (RAN) if configured) while it is waiting for the VNS call to be completed. When an alerting message is received from the target node, the ringback or RAN is removed and the speechpath with the Bearer is connected. The user will thus hear ringback tone (given either by the PSTN or the Meridian 1 at the target node, depending on the Bearer type), until the agent answers the call.

If for some reason the ALERTING message is not received, the user is requeued (at the top of the queue at the source node). Since ringback or RAN were not removed in the first place, the user is unaware that an attempt to reach a remote agent has been made and has failed.

Since PSTN Bearer trunk call establishment may take longer than PRI2 TIE trunk call establishment, it is necessary to allow more time for the call to arrive at the agent's set than provided by the regular NACD feature. The Agent Reservation Timer should be configured to accommodate a longer interval.

If an agent is reserved at the target node, but the call fails to reach that node (e.g., all trunks are busy), the agent will stay reserved until NACD Target Reservation Timer (RAGT) expires (the target node has no indication that the call has encountered a busy condition). This is more critical when NACD is used with VNS, because (RAGT) must be set to a greater value.

NACD allows up to 20 remote target nodes to be defined in the routing tables. Since the maximum number of VNS Virtual DNs per customer is 100, it is not realistic to configure 20 target nodes using VNS routing: this would only allow five Virtual DNs per target node and thus a maximum of five simultaneous calls.

Network Call Party Name Display

Network Call Party Name Display is supported on VNS routes. All display information is taken from messages on the VNS D-channel. The VNS Bearer does not drive the display of such information.

Network Distinctive Ringing

For an incoming DID call (without VNS) that tandems to another node using VNS, the feature will be supported as it would have been if an ISDN TIE trunk had been used for the VNS call.

Overlap Sending and Overlap Receiving

Call establishment over the VNS D-channel will not use overlap sending/receiving even if configured. Enbloc sending will always be used on the VNS D-channel. Overlap sending/receiving will be supported on the Bearer trunks if that capability already exists.

Periodic Pulse Metering

Periodic Pulse Metering is supported on the VNS Bearer trunks only.

R2 Multifrequency Compelled Signaling to DPNSS1 Gateway

If the call on the DPNSS1 (or R2MFC) trunk is tandeming to the R2MFC or (DPNSS1) trunk on a Virtual Network Services (VNS) call, the R2MFC to DPNSS1 Gateway feature does not apply. If a DPNSS1/R2MFC tandem is encountered during the routing of a VNS call, the R2MFC to DPNSS1 Gateway feature applies. The following figure illustrates how the R2MFC-DPNSS1 gateway may apply to a VNS call.

Three Wire Analog Trunk – Commonwealth of Independent States (CIS)

Virtual Network Services is not supported on CIS trunks.

Trunk Barring

Three cases apply for Trunk Barring:

1 When the second trunk involved in the call is used by VNS, no trunk barring is applied regardless of the configuration of the first trunk. The call is always allowed to get through.

Note: This implementation completely overrides the Trunk Barring feature.

2 When the first trunk involved in the call uses VNS, and the second one is not used by VNS, trunk barring is performed according to the content of the default Access Restriction Table (ART) for the TIE trunk.

3 When neither the first trunk nor the second trunk is involved in a VNS call, the usual rules for Trunk Barring apply.

Vacant Number Routing

Calls rerouted by the Vacant Number Routing feature are not allowed to have digit manipulation performed on the DN dialed. Thus, for non VNS calls, no Digit Manipulation Index (DMI) can be associated in the Route List Index (RLI) used by Vacant Number Routing. For VNS calls (in LD 86, the entries on this RLI are defined with the prompt VNS = YES), it is not allowed to associate any manipulation on the digits included in the messages exchanged over the VNS D-channel. In these cases, the prompt VMDI is not displayed, but the prompt DMI is still displayed.

Advice of Charge for Euro ISDN

For a Virtual Network Service (VNS) simple call connectivity, received charging information is stored against the Message Registration meter of the calling party's set.

On an outgoing trunk call on VNS connectivity, charging information is processed based on the Trunk to Trunk Connection feature.

Feature packaging

The Virtual Network Services (VNS) package is 183.

The following software packages are also required for VNS:

- Network Alternate Route Selection (NARS) package 58, which is dependent on Basic Routing (BRTE) package 14 and Network Class of Service (NCOS) package 32;
- Integrated Services Digital Network (ISDN) package 145;
- ISDN Signaling Link (ISL) package 147;
- Advanced Network Services (NTWK) package 148;
- Primary Rate Access (PRI) package 146, or 2.0 Mb PRI (PRI2) package 154 is required if VNS uses the D-Channel of a PRI or PRI2 trunk for its signaling (USR = SHAV);
- Integrated Services Digital Network Supplementary (ISDNS) package 161.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1 LD 17 – Configure Virtual Network Services.

2 LD 79 – Add or create a new single VDN or a block of contiguous VDNs.

3 LD 79 – Remove a single VDN or a block of contiguous VDNs, or remove all existing VDN data blocks.

4 LD 79 – Disable or enable single VDN, or a block of contiguous VDNs.

5 LD 79 – Print VNS information for a customer.

6 LD 86 – Assign D-channel number and VNS digit manipulation index to be used when signaling on the Bearer trunk and on the D-channel.

7 LD 16 – The following TIMR, TIMR, and VRAT prompts have been added to this overlay:

LD 17 – Configure Virtual Network Services.

Prompt	Response	Description
REQ	NEW CHG	New, or change.
TYPE	ADAN aaa xx	Action device and number.
...		
- USR	VNS	To define a D-channel used for Virtual Network Services (or ISLD).
	SHAV	To define a D-channel shared between PRI and VNS (and ISLD).
- VNSM	0-100	Define the maximum number of VNS channels over the D-channel.
- VNSC	xx	Virtual Network Services Customer number.
- VNSP	0-32700	Private Network Identifier (PNI) of the far end customer.
- VNCA	YES	Network Call Party Name Display is available over this D-channel for VNS.
- VCRD	YES	Network Call Redirection is available over this D-channel for VNS.
- VTRO	YES	Trunk Route Optimization before answer is available over this D-channel for VNS. This prompt is optional and is not a prerequisite for VNS.

The following steps describe how to:

- Add or create a new single VDN or a block of contiguous VDNs

- Remove a single VDN or a block of contiguous VDNs
- Disable or enable a block of VDNs, or print VNS information for a customer

LD 79 – Add or create a new single VDN or a block of contiguous VDNs.

Prompt	Response	Description
REQ	NEW	Add or create a new single VDN or a block of contiguous VDNs. ***Note:*** The CHG command is not supported; you must use the NEW command to enter information.
TYPE	VNS	Virtual Network Services.
CUST	xx	Customer number.
VNDN	xx...x 1-4000 xx...x	Individual VDN to be added. 1-4000 = number of contiguous VDN to be added xx...x = first VDN to be added.
	<CR>	You may add another single VDN or a block of contiguous VDNs by entering <CR> after the VNDN entry. VNDN is prompted until <CR> is entered. In this case, the REQ prompt will appear again. ***Note:*** For the above entries, the VDNs must be part of the customer's numbering plan.

LD 79 – Remove a single VDN or a block of contiguous VDNs, or remove all existing VDN data blocks.

Prompt	Response	Description
REQ	OUT	Remove a single VDN or a block of contiguous VDNs, or remove all existing VDN data blocks. ***Note:*** You cannot remove only certain VDNs from a block; you have to remove the entire block.
TYPE	VNS	Virtual Network Services.
CUST	xx	Customer number. At least one D-Channel must be configured with USR = VNS or USR = SHAV and having VNS = customer number.

VNDN	XALLVDNS xx...x	Remove all VNS data blocks. Remove an individual VDN, or the first VDN of a block of contiguous VDNs.
	<CR>	You may remove another single VDN, or a block of contiguous VDNs, by entering <CR> after the VNDN entry. VNDN is prompted until <CR> is entered. In this case, the REQ prompt will appear again. If XALLVDNS is entered, the message REMOVE ALL VDN BLOCKS? is then output, followed by the CONF prompt.
CONF	YES	To confirm the removal of all VDN blocks.

LD 79 – Disable or enable single VDN, or a block of contiguous VDNs.

Prompt	Response	Description
REQ	DIS ENL	Disable a single VDN or a block of contiguous VDNs Enable a single VDN or a block of contiguous VDNs
TYPE	VNS	Virtual Network Services.
CUST	xx	Customer number. At least one D-Channel must be configured with USR = VNS or USR = SHAV and having VNS = customer number.
VNDN	xx....x	Individual VDN, or first VDN of a block of contiguous VDNs to be disabled or enabled.
	<CR>	You may enable or disable another single VDN, or a block of contiguous VDNs, by entering <CR> after the VNDN entry. VNDN is prompted until <CR> is entered. In this case, the REQ prompt will appear again.

LD 79 – Print VNS information for a customer.

The information is output after the customer number is entered in response to the CUST prompt.

Prompt	Response	Description
REQ	PRT	Print VDN information.
TYPE	VNS	Virtual Network Services.

CUST	xx	Customer number. At least one D-Channel must be configured with USR = VNS or USR = SHAV and having VNS = customer number. The VNS information is output for the customer. For a range of VDNs, the first VDN is displayed, followed by "—" and the last VDN of the block. On the same line, the number of VDNs in the block is displayed in brackets. For a single VDN, the VDN is displayed followed by "(1)". If a block is disabled, the above indication is followed by the number of VNS calls still using a VDN in the block. These calls have to be cleared before the VDN block can be removed. At the end, the total number of VDNs configured for the customer is output. A sample output could be: 7676 (1) 8100—8199 (100) TOTAL NUMBER OF VDN FOR CUST 2: 101 If the VDN block 8100-8199, containing 100 VDNs, is disabled, the output would be: 7676 (1) 8100—8199 (100) *DISABLED - VDN USED: 2* TOTAL NUMBER OF VDN FOR CUST 2: 101 In this case, the VDN block is disabled and two VNS calls are still using two VDNs. These two calls must first be cleared before the VDN block 8100-8199 can be removed.

LD 86 – Assign D-channel number and VNS digit manipulation index to be used when signaling on the Bearer trunk and on the D-channel.

Prompt	Response	Description
REQ	NEW CHG	New, or change.
...		
ENTR	0-63	Entry number for NARS/BARS Route List.

ROUT	0-511	The number of the route to be associated with the VNS Bearer channel.
VNS	YES	Virtual Network Services.
VDCH	0-63	The D-channel used for these VNS calls (must be configured in LD 17).
	0-15	For Option 11C.
VDMI	xxx	The Digit Manipulation Table to be used on the VNS D-channel.
	(0)	No digit manipulation required.
	1-31	For Coordinated Dialing Plan feature.
	1-255	For NARS/BARS.
VTRK	1-(20)-100	Number of VNS trunks allowed on the route.
DMI	xxx (0) 1-31 1-255	The Digit Manipulation table to be used on the VNS Bearer. No digit manipulation required. For Coordinated Dialing Plan feature. For NARS/BARS.

LD 16 – The following TIMR, TIMR, and VRAT prompts have been added to this overlay:

Prompt	Response	Description
REQ	NEW CHG	New, or change.
TYPE	RDB	Route Data Block.
CUST	xx	Customer number.
ROUT	0-511	The number of the route to be associated with the incoming VNS Bearer channel.
CNTL	YES	Change control of timers.
- TIMR	VSS (0) 1 2-1023	VNS Set Speechpath Timer 0 = Do not answer the bearer channel until the terminating party answers. 1 = Answer the Bearer channel immediately on arrival. 2-1023 = Answer the Bearer channel after specified seconds (rounded down to two-second multiples) if the terminating party has not already answered.
- TIMR	VGD 0-(6)-31	VNS Guard Timer The time allowed for the Bearer trunk call to disconnect, in seconds. This is a guard timer on the associated VNS DN.
...		
VRAT	(NO) YES	VNS Return Attendant Tones Option Do (not) answer an attendant extended call over VNS immediately on the incoming Bearer trunk.

Feature operation

There are no operating procedures specified for this feature.

ISDN BRI features

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Reference list

The following are the references in this section:

- *Features and Services* (553-3001-306)
- *ISDN Basic Rate Interface: Administration* (553-3901-300)

Feature description

This chapter describes the ISDN BRI-specific features that are supported on Meridian 1 Options 11C, 51C, 61C, and 81C.

> ***Note:*** Since ISDN BRI trunking is not supported in North America, the features in this section that function within an ISDN BRI trunking environment are not supported in North America.

The following unique ISDN BRI features are described in this section:

- ISDN BRI Calling Line Identification Presentation/Calling Line Identification Restriction
- ISDN BRI circuit-switched data calls
- ISDN BRI National ISDN-1 Conference
- ISDN BRI Special Call Forward Busy
- ISDN BRI Special Hunting
- ISDN BRI ETSI Call Forwarding Unconditional
- ISDN BRI ETSI Conference
- ISDN BRI National ISDN-1 Call Forward All Calls
- ISDN BRI Connected Line Presentation (COLP)/Restriction (COLR)
- NI-1 BRI Compliance Enhancements

This chapter also summarizes the level of support provided for the general suite of Generic X11 features on ISDN BRI. The features have been divided in sections based on full support, partial support, or no support.

ISDN BRI Calling Line Identification Presentation and Restriction

Feature description

This feature allows or restricts the display of a Calling Line ID on the called party terminal. Calling Line ID Presentation (CLIP) controls the called party ISDN BRI terminal's choice to display the calling line identification for incoming calls.

Presentation (PRES) controls the calling terminal's choice to send or PRES restricts sending the Calling Line ID when placing an outgoing call. The calling terminal can choose to send or restrict sending the calling line identification on a call-by-call basis. The PRES button on the ISDN BRI terminal can be set to YES to allow sending the calling line identification or set to NO to restrict sending the calling line identification to the called terminal. The PRES button on the terminal overrides the PRES parameter. CLIP and PRES parameters are configured for an ISDN BRI DN when configuring the TSP using LD 27.

The calling party number is contained in the calling party information element in the setup message. The information element is optional and need not be contained in the setup message. If the information element is not presented, the default DN selected in the TSP is used as the calling party DN.

If the call is originated from a non-ISDN BRI to an ISDN BRI terminal, the calling party number is based on the class of service of the non-ISDN BRI terminal. The class of service can be set for PDN which uses the primary DN of the non-ISDN BRI terminal as the calling party number or LDN which uses the listed DN of the non-ISDN BRI terminal customer as the calling party number.

If the calling party is using an ISDN BRI terminal and has called party number restricted, the called party's display shows the trunk access code rather than the ISDN BRI DN.

Operating parameters

There are no Operating parameters associated with this feature.

Feature interactions

There are no Feature interactions associated with this feature.

Feature packaging

There is no new feature package introduced by this feature. However, the following feature packages are required for ISDN BRI:

- Basic Rate Interface (BRI) package 216
- Basic Rate Interface line application (235)

Feature implementation

There are no specific implementation procedures for this feature. The PRES parameter. CLIP and PRES parameters are configured for an ISDN BRI DN when configuring the TSP using LD 27

Feature operation

No specific operating procedures are required to use this feature.

ISDN BRI National ISDN-1 Conference

Feature description

This version of ISDN BRI Conference is based on National ISDN-1.

Terminals which are supported are:

- Nortel Network's M5317TDX (version 2.3a and above)
- Nortel Network's M5209TDcp (version 2.28 and above), and
- third-party vendor manufactured terminals which are deemed compatible

ISDN BRI terminals can conference in both ISDN BRI and non-ISDN BRI terminal users. An ISDN BRI terminal can also be conferenced into a call by a non-ISDN BRI terminal.

Meridian 1 ISDN BRI supports two versions of Conference: A03, a 3-party Conference and A06, a 6-party Conference. See *ISDN Basic Rate Interface: Administration* (553-3901-300) for configuration details.

ISDN BRI Conference operates under the following conditions:

- the user employs the National ISDN-1 protocol (PRID=6) on the DSL
- the user is subscribed to Conference in its Terminal Service Profile.
- the Feature Activation Identifier and the Feature Indication Identifier are configured both in LD 27 and on the ISDN BRI terminal.
- the logical terminal is the controller of only one conference call.
- the bearer capability of the call associated with the conference request is speech or 3.1 kHz audio.

Invoke Conference while making a call

The ISDN BRI user may make a conference request by means of a pre-defined softkey or programmable key while dialing the outgoing digits.The provision of this capability is dependent on the implementation of the ISDN BRI terminal.

Invoke Conference during an established call

An ISDN BRI user can invoke Conference after the network successfully translates the dialed digits, or while the called party is being rung, or while the user is on an answered call.

Add a conferee

The ISDN BRI user can add a conferee with Consultation Hold, add a held call to an active conference, or add an active call to a held conference providing:

- the Conference Controller (an ISDN BRI user who is subscribed to Conference) is connected to only one active speech or 3.1 kHz audio call
- both the active call and the held call have been answered
- neither the active call nor the held call is undergoing call clearing
- the controller’s conference size is not exceeded

- the B-channel to which the Conference Controller is connected can be used to complete the conference
- both calls are not conference calls

Conference disconnect

If the controller requests a disconnect signal, the network disconnects the entire conference if:

- only one party will remain after the controller disconnects
- none of the calls that will remain has been answered
- only two parties remain and both are outgoing trunk calls
- more than two parties remain and all are trunk calls

Otherwise, only the controller is disconnected and the rest of the conferees remain.

Call Transfer during Conference

Using the Conference feature, a Call Transfer can be achieved in the following way:

Ann makes a call to Bob. Bob answers the call and conferences Carl. After Carl answers the call, Bob completes the conference. Then Bob can disconnect himself from the conference, thus transferring Ann to Carl.

The same conditions that determine whether the remaining parties in a conference should be dropped when one party disconnects from the conference apply here. For example, Bob makes a call to Ann. Then Bob conferences in Carl. If both Ann and Carl are on a remote node (that is, both calls made by Bob to Ann and Carl are outgoing trunk calls), then as Bob disconnects from the conference, both Ann and Carl will be dropped as well. Call Transfer cannot be achieved in this scenario.

Operating parameters

There are no operating parameters associated with this feature.

Feature interactions

There are no feature interactions associated with this feature.

Feature packaging

There is no new feature package introduced by this feature. However, the following feature packages are required for ISDN BRI:

- Basic Rate Interface (BRI) package 216
- Basic Rate Interface line application (235)

Feature implementation

Task summary list

The following is a summary of the tasks to configure ISDN BRI National ISDN-1 Conference:

1 LD 27 – Configure National ISDN-1 for a DSL.

2 LD 27 – Configure Conference in the TSP.

LD 27 – Configure National ISDN-1 for a DSL

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	DSL	Digital Subscriber Loop.
DSL	lll s c dsl#	DSL address, for Options 51C, 61C, 81C.
	c dsl#	DSL address, for Option 11C.
...		
PRID	6	Protocol Identification. Enter 6 for NI-1.
FDN	nnnnnnn	Flexible Call Forward No Answer DN.
...		

LD 27 – Configure Conference in the TSP.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	TSP	Terminal Service Profile.
DSL	lll s c dsl#	DSL address for Options 51C, 61C, 81C (as already entered in step 1).
	c dsl#	DSL address, for Option 11C (as already entered in step 1)
...		
FEATID	aaa mmm nnn Xmmm <cr>	Feature ID (must be unique for a TSP), where: aaa = feature; enter AO6 for six-party conference (up to 30 parties can be conferenced, but it is not recommended), or AO3 for three-party conference. mmm = feature activation ID (1-127). nnn = feature indication ID (1-127). Xmmm = delete feature. <cr> = skip feature ID definition (aaa mmm nnn is re-prompted until <cr> is entered.
...		

Feature operation

No specific operating procedures are required to use this feature.

ISDN BRI circuit-switched data calls

ISDN BRI to ISDN BRI circuit-switched data calls

Circuit-switched data calls between two ISDN BRI terminals are supported for all bearer capability encodings. The Meridian 1 screens for the validity of its bearer capability codepoints only; it does not screen for protocol compatibility between two ISDN BRI devices. The Meridian 1 presents the call to the terminating party; the two ISDN BRI devices determine whether they can communicate with the specified bearer capability. If the ISDN BRI terminals decide that the protocol is incompatible, either terminal may drop the call.

ISDN BRI accessing Meridian 1 data modules

Meridian 1 offers data access through special data adapters (for example, ASIM). These adapters provide Nortel Networks proprietary DM-DM protocol for data transmission. The ISDN BRI terminal cannot communicate with these adapters because of protocol incompatibility. Calls from an ISDN BRI terminal to these data modules are blocked; similarly, calls from these data modules to an ISDN BRI terminal are also blocked.

ISDN BRI terminals can communicate with these data modules under one condition: ISDN BRI terminals that support the TLINK protocol can communicate with these Meridian 1 data adapters if the circuit-switched data call is placed across an ISDN PRI or DTI link. This access is possible because the ISDN PRI or DTI pack provides protocol conversion from TLINK to DM-DM and vice versa.

ISDN BRI accessing Meridian Communication Adapters

The MCA operates in three modes: DM-DM, TLINK and PSDS. An MCA operating in TLINK mode communicates with ISDN BRI terminals that support TLINK protocol. Calls from an ISDN BRI terminal (with the appropriate bearer capability encodings) to an MCA and vice versa are allowed to terminate; however, if the protocol exchange fails between the ISDN BRI and MCA devices, if the MCA is not operating in TLINK mode, for example, then the call may be dropped by either device.

The following describe the bearer capability encodings used by ISDN BRI terminals that support TLINK protocol. Only calls originating from ISDN BRI with these bearer capability encodings are allowed to terminate to a MCA:

- 64k clear:
  - — Octet 3 = unrestricted digital information, octet 4 = 64 kbits/s, no octet 5s are included.
- 64k restricted:
  - — Octet 3 = restricted digital information,
  - — octet 4 = 64 kbits/s, no octet 5s are included.
- 56k:
  - — Octet 3 = restricted or unrestricted digital information,
  - — octet 4 = 64kbits/s, octet 5 = v.110 and octet 5a = 56kbits/s.

ISDN BRI accessing ADM trunks

ADM trunk is not a trunk; it groups ADM devices in a route to allow an idle ADM device defined in the given route to be searched or hunted easily when the route access code is dialed. The Meridian Communication Unit (MCU) may be defined as an ADM trunk with the MCU trunk as a subtype. Because MCU can support TLINK protocol, an ISDN BRI terminal accessing this type of ADM route is allowed to terminate to an idle device found in the route and the conditions described for accessing MCA apply here. However, if the ADM route is not an MCU trunk subtype, then ISDN BRI is blocked from accessing the ADM routes because of incompatible protocols.

ISDN BRI terminals may access an ADM trunk that are not MCU subtype under one condition: ISDN BRI terminals that support TLINK protocol can access an ADM trunk if the circuit-switched data call is placed across an ISDN PRI or DTI link. This access is possible because the ISDN PRI or DTI pack provides protocol conversion from TLINK to DM-DM and vice versa.

ISDN BRI accessing ISDN PRI

The ISDN PRI interface supports three bearer capability encodings:

- 64k clear:
  - Octet 3 = unrestricted digital information, octet 4 = 64 kbits/s, no octet 5s are included.
- 64k restricted:
  - Octet 3 = restricted digital information, octet 4 = 64 kbits/s, no octet 5s are included.
- 56k:
  - Octet 3 = restricted or unrestricted digital information, octet 4 = 64kbits/s, octet 5 = v.110 and octet 5a = 56kbits/s.

ISDN BRI originated circuit-switched data calls are allowed access to ISDN PRI trunk if these encodings are used.

ISDN BRI devices using other bearer capability encodings can communicate with another ISDN BRI device across ISDN PRI under these conditions:

- the ISDN PRI interface is Meridian 1, Japan D70, or 4ESS/5ESS
- the remote capability for ISDN BRI interworking is turned on (in LD 17) for all ISDN PRI interfaces involved in the call.

ISDN BRI accessing DTI trunks

ISDN BRI circuit-switched data call can access a DTI trunk only if the bearer capability is:

- 56k:
  - octet 3 = restriction or unrestricted digital information, octet 4 = 64 kbits/s, octet 5 = v.110 and octet 5a = 56 kbits/s

ISDN BRI terminals using V.120 protocol at 56 kbps are not supported over DTI trunks.

ISDN BRI circuit-switched data call tandem across ISDN PRI

In the ISDN PRI and DTI pack, a protocol convertor is inserted by default to convert DM-DM protocol to TLINK at the tandem node and vice versa. Because of this, an ISDN BRI circuit-switched data call tandem across ISDN PRI, DTI trunks or a combination of ISDN PRI and DTI trunks is supported only for ISDN BRI terminals that use TLINK protocol. ISDN BRI terminals using other protocols, such as V.110 and V.120, require the Transparent Data Networking feature to provide transparent data channel through the tandem nodes.

Public Switched Data Service

Public switched data service provides a pure 56 kbps data transmission. The data module on both ends must establish identical parameters manually before the data call is made.

ISDN BRI terminals can access Public Switched Data Service provided a dedicated data route is used; when a voice/data shared route is used, the ISDN BRI terminal must generate a burst of tone to the network provider to turn off the echo cancellation.

ISDN BRI accessing analog line by means of a modem trunk

ISDN BRI circuit-switched data calls accessing analog lines through modem trunks are supported only if the data module connected to the modem uses TLINK, V.110 or V.120 protocol.

An ISDN BRI device with the TLINK protocol can access analog lines through modem trunk configuration using a DTE type MCU, because the MCU supports TLINK protocol. ISDN BRI devices cannot communicate with other Meridian 1 DTE type data modules that connect to modems because they use the DM-DM protocol.

ISDN BRI terminals may access analog lines through modem trunk configurations using DM-DM type data modules under one condition: ISDN BRI terminals that support TLINK protocol can access these modem trunks if the circuit-switched data call is placed across an ISDN PRI or DTI link. This access is possible because the ISDN PRI or DTI pack provides protocol conversion from TLINK to DM-DM and vice versa.

Operating parameters

There are no operating parameters associated with this feature.

Feature interactions

There are no feature interactions associated with this feature.

Feature packaging

There is no new feature package introduced by this feature. However, the following feature packages are required for ISDN BRI:

- Basic Rate Interface (BRI) package 216
- Basic Rate Interface line application (235)

Feature implementation

There are no specific implementation procedures for this feature.

Feature operation

No specific operating procedures are required to use this feature.

ISDN BRI Special Call Forward Busy

Feature description

This feature is activated for a call terminated at a DSL. The call is forwarded to the attendant when a call encounters the following busy conditions:

- the maximum number of calls on a DSL is exceeded, and
- an ISDN BRI DN has Call Forward busy enabled, as configured in the TSP using LD 27
- ISDN Hunting is not allowed or the call fails to find an idle hunt DN.

The calling party receives a busy tone in all other cases.

With Call Forward Busy, Special Hunting, if both B-channels are defined and there is not a second DN, the result is Busy.

Operating parameters

There are no operating parameters associated with this feature.

Feature interactions

There are no feature interactions associated with this feature.

Feature packaging

There is no new feature package introduced by this feature. However, the following feature packages are required for ISDN BRI:

- Basic Rate Interface (BRI) package 216
- Basic Rate Interface line application (235)

Feature implementation

There are no specific implementation procedures for this feature.

Feature operation

No specific operating procedures are required to use this feature.

ISDN BRI Special Hunting

Feature description

This feature is activated when a call terminating at a DSL encounters the following busy conditions:

- the maximum number of calls on a DSL is exceeded, or
- the total number of calls including active, on hold, waiting, and in progress exceeds the number of B-channels provided for the incoming call type

Hunting routes the call through predetermined steps until an idle DN is found for that call. Internal and external hunt DNs are configured in the DSL and Hunting Allowed and Call Forward by Call type are configured in the TSP using LD 27.

If Hunting is not allowed or the call fails to find an idle DN, the following occurs:

- a busy tone is given if the number of calls exceeds the maximum calls specified for that DSL and call forward busy does not succeed.

  Note: The call is forwarded only if it is a DID call

- the call is presented as Call Waiting if the maximum number of calls for that DSL is not exceeded.

An ISDN BRI terminal originating the call is not updated to show on its display that the call was redirected to a different DN as a result of Hunting. This is due to a lack of standard for layer 3 messages used to update the terminal display.

Operating parameters

There are no operating parameters associated with this feature.

Feature interactions

There are no feature interactions associated with this feature.

Feature packaging

There is no new feature package introduced by this feature. However, the following feature packages are required for ISDN BRI:

- Basic Rate Interface (BRI) package 216
- Basic Rate Interface line application (235)

Feature implementation

There are no specific implementation procedures for this feature.

Feature operation

No specific operating procedures are required to use this feature.

ISDN BRI ETSI Call Forwarding Unconditional

Feature description

The European Telecommunication Standards Institute (ETSI) Call Forwarding Unconditional (CFU) supplementary service allows an incoming call to an ISDN BRI terminal to be forwarded to a predetermined destination, within or outside the Meridian 1 system. The call is forwarded regardless of whether the user is busy or idle.

Voice and data basic services can be individually forwarded to the same DN. Also, calls can be forwarded to an ISDN BRI terminal or a non-ISDN BRI terminal. When the CFU feature is activated, outgoing calls can still be made from the ISDN BRI terminal.

The Call Forwarding capabilities may be provided to all users on the access (i.e., all the DNs defined under a DSL), or an individual user (i.e., a DN).

The following functionalities are currently supported:

- When a call is forwarded, if the caller is using an ISDN BRI set they will be notified by the Meridian 1 that the call has been forwarded. In addition, the caller is provided with the forwarded-to number.
- When a call is forwarded from an ISDN BRI terminal that has CFU activated, the terminating terminal will be notified by the Meridian 1 that the ISDN BRI terminal forwarded the call.

Operating parameters

The ETSI CFU supplementary service is based on the Meridian 1 Call Forwarding All Calls feature. Therefore, Meridian 1 Call Forwarding All Calls feature limitations also apply to this feature.

ETSI CFU basic service is limited to speech, 3.1 kHz audio, unrestricted digital information and restricted digital information.

Interrogation of all served users in TSP 0 will be supported. However, if the number of DNs is too large to fit into one message, interrogation of all served users in TSP 0 will not be supported.

ETSI public ISDN partial rerouting will not be supported. According to ETSI standards, when the Meridian 1 receives a local exchange call and the call is forwarded within or outside of the system, the Meridian 1 should send a message to the local exchange to make the call directly to the forwarded-to user.

During a data dump, the forwarded-to user's address will not be saved because of protected data storage space. In LD 17, the CFWS prompt, which enables users to save Call Forwarding feature activation during data dump so that during SYSLOAD the feature will be activated, will be ignored for users of ISDN BRI.

ISDN BRI terminals that support ETSI Call Forward Unconditional supplementary service are required.

Feature interactions

Call Waiting

User requesting all calls to be forwarded – ETSI CFU takes precedence over Call Waiting.

Forward-to user – A forwarded call can invoke Call Waiting.

Conference Call, Add-on

Calling user – If a conference controller calls a person who has CFU activated to establish a conference, the forwarded-to user will be alerted and added to the conference call after the call is answered.

Forwarded-to user – A call that has been forwarded to the conference controller can be added to an existing conference. A forwarded-to user can establish a conference using the existing forwarded call provided that the call is in the active state.

Call Forward All Calls

The Meridian 1 Call Forward All Calls feature allows only calls to the Prime DN or a single appearance DN to be forwarded. For an ISDN BRI set, calls are forwarded based on this basic service. Since ETSI CFU supplementary service is developed based on the Call Forward All Calls feature, all the existing Feature interactions of Call Forward All Calls apply to ISDN BRI terminals.

BRI Special Call Forward Busy Call Forward No Answer

The ETSI CFU supplementary service takes precedence over BRI Call Forward Busy, and Call Forward No Answer.

Call Forward and Busy Status

Call Forward and Busy Status allows a user to forward calls and monitor the Call Forward and Busy Status from the forwarded-to user. This requires a Busy/Forward Status key. An ISDN BRI terminal cannot monitor other set's Call Forward Busy Status and in turn its Call Forward Busy Status cannot be monitored by other sets.

Remote Call Forward

Remote Call Forward allows a user to program Call Forwarding from a remote set. Call Forwarding remotely to an ISDN BRI terminal is supported. However, using Remote Call Forward from an ISDN BRI terminal is not supported.

Attendant and Network-wide Remote Call Forward

This feature allows the configuration of Call Forward from an Attendant Console and a remote set across a Meridian Customer Defined Network (MCDN). For an ISDN BRI terminal, Remote Call Forward is allowed from a set, or from an Attendant Console, but not from a BRI set either locally or network wide. When Call Forward is activated, it is assumed that the Call Forward for the BRI set is voice, not data.

Call Forward/Hunt Override via Flexible Feature Code

This feature allows all attendants and sets with Call Forward/Hunt Override Allowed (CFHA) Class of Service to override Call Forward All Calls (CFAC). Since an ISDN BRI terminal cannot access Flexible Feature Codes, it cannot override CFAC on other sets. However, an ISDN BRI set's Call Forward Unconditional can be overridden by a set having CFHA Class of Service or by an attendant in both standalone and network environments.

Internal Call Forward

An ISDN BRI terminal cannot activate the internal Call Forward feature.

Call Forward Reminder Tone

The Call Forward Reminder Tone is supported on ISDN BRI sets that have the Call Forward Unconditional feature active.

Call Forward Confirmation Tone

During activation or deactivation of Call Forward from a BRI terminal, a Call Forward confirmation tone is not provided to the BRI terminal. Instead, confirmation is done by sending a BRI message to the terminal.

Feature packaging

There is no new feature package introduced by this feature. However, the following feature packages are required for ISDN BRI:

- Basic Rate Interface (BRI) package 216
- Basic Rate Interface line application (235)
- Meridian 1 Extended Peripheral Equipment (XPE) package 203

Feature implementation

Task summary list

The following is a summary of the tasks to configure ISDN BRI Call Forwarding Unconditional:

1 LD 27 – Configure ETSI protocol for a DSL.

2 LD 27 – Configure an ISDN BRI terminal.

LD 27 – Configure ETSI protocol for a DSL.

Prompt	Response	Description
REQ	NEW	Add new data.
TYPE	DSL	Digital subscriber loop.
DSL	lll s c dsl#	DSL address, for Options 51C, 61C, 81C.
	c dsl#	DSL address, for Option 11C.
...		

PRID ...	2	Protocol Identification. Enter 2 for ETSI.

LD 27 – Configure an ISDN BRI terminal.

Prompt	Response	Description
REQ	NEW	Add new data.
TYPE	TSP	Terminal Service Profile.
DSL	lll s c dsl#	DSL address for Options 51C, 61C, 81C (as already entered in step 1).
	c dsl#	DSL address, for Option 11C (as already entered in step 1)
USID	(0)-15	User service identifier. 0 = default TSP.
MPHC	NO	This TSP is not configured for a Meridian 1 Packet Handler.
SPID	aaa...a <cr> Xaaa...a	Service profile ID aaa...a = any combination of 1-20 alphanumeric characters. <cr> = Stops this prompt from being displayed again. A maximum of 8 valid SPIDs per TSP are allowed. Xaaa...a removes the specified SPID. This prompt appears only if USID = 1-15. It repeats until <cr> is entered, but only up to 8 SPIDs may be entered. This SPID must be entered in the initializing terminal to associate the terminal with a USID.
DN	xxxx (0)-N	xxxx = DN to be associated with the TSP. (0)-N = CLID entry, with N = CLID SIZE-1 (SIZE defined in LD 15).
CT	VCE DTA	Call type (enter VCE for voice or DTA for data).
...		

FEAT	CFXA	Allow Call Forward External for the DN.
SSRV_ ETSI	VCFW DCFW	For voice call type, enter VCFW for Voice Call Forward. For data call type, enter DCFW for Data Call Forward.
...		

Feature operation

No specific operating procedures are required to use this feature.

ISDN BRI ETSI Conference

Feature description

The ISDN BRI Supplementary Services European Telecommunication Standards Institute (ETSI) Conference feature provides a subset of the Conference capabilities to ISDN BRI users connected to a Meridian 1 using ETSI protocols.

The following capabilities are supported:

- Conference invocation (beginning the conference from the active call state)
- Adding a conferee
- Disconnection by a conferee
- Termination of the conference (this subfeature will not be implemented as ETSI specifies. ETSI specifies that when a conference controller disconnects, all conferees will be disconnected; however, this subfeature follows the current Meridian 1 Conference feature in that when a conference controller disconnects the conference continues for the remaining parties).

An ISDN BRI user can conference a maximum of three or six parties depending on the Terminal Service Profile (TSP) configuration administered through LD 27. The ETSI Conference feature can be invoked by a user while the user is on an established call. Once conference is invoked, the user can add another party (active or held) to the conference call.

Operating parameters

ISDN BRI terminals must support both ETSI basic call and ETSI Conference Supplementary service signaling protocols.

ETSI Conference only supports speech or 3.1 kHz; other bearer services such as 7 kHz, unrestricted digital information, and restricted digital information are not supported.

In a conference call, a maximum of two parties (including conference controller and conferees) can be from the same Digital Subscriber Loop (DSL), due to the availability of only two B-channels per ISDN BRI interface.

The Meridian 1 only sends notification messages to conferees or the conference controller when conference operations are requested and performed if they are ISDN BRI users. If a user is on another node across ISDN or non-ISDN trunks, the Notify message will not be sent.

Feature interactions

Conference

ISDN BRI terminals can conference in both ISDN BRI and non-ISDN BRI terminal users; similarly, an ISDN BRI terminal can also be conferenced into a call by a non-ISDN terminal. However, in either case, the ISDN BRI terminal display will not be updated due to lack of protocol to support it.

ISDN PRI Network Call Redirection

When an ISDN BRI conference call is dropped to a simple call, if a party in the simple call is an ISDN BRI user, the corresponding BRI name and number will be updated on the other party's non-ISDN set display. However, the ISDN BRI display will not be updated due to lack of standard protocol to support this function.

Held Call Clearing

Held Call Clearing allows a set to clear both active calls and held calls by going on-hook. This will not apply to an ISDN BRI set.

ISDN BRI Trunk Access

ISDN BRI ETSI Conference is supported across ISDN BRI trunks.

Feature packaging

There is no new feature package introduced by this feature. However, the following feature packages are required for ISDN BRI:

- Basic Rate Interface (BRI) package 216
- Basic Rate Interface line application (235)
- Meridian 1 Extended Peripheral Equipment (XPE) package 203.

Feature implementation

Task summary list

The following is a summary of the tasks to configure ISDN BRI ETSI Conference:

1 LD 27 – Configure ETSI protocol for a DSL.

2 LD 27 – Configure Conference in the TSP.

LD 27 – Configure ETSI protocol for a DSL.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	DSL	Digital Subscriber Loop.
DSL	lll s c dsl#	DSL address, for Options 51C, 61C, 81C.
	c dsl#	DSL address, for Option 11C.
...		
PRID	2	Protocol Identification. Enter 2 for ETSI.
	(WTA), WTD	Enter WTD for Warning Tone Denied (Warning Tone Allowed has to be overridden).
...		

LD 27 – Configure Conference in the TSP.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	TSP	Terminal Service Profile.
DSL	lll s c dsl#	DSL address, for Options 51C, 61C, 81C (as already entered in step 1).
	c dsl#	DSL address, for Option 11C (as already entered in step 1)
...		
SUPL_ SVC	AO6 AO3	AO6 = six-party conference (up to 30 parties can be conferenced, but it is not recommended). AO3 = three-party conference.
...		

Feature operation

No specific operating procedures are required to use this feature.

ISDN BRI National ISDN-1 Call Forward All Calls

Feature description

The ISDN BRI National ISDN-1 Call Forward All Calls feature enables a user to have calls redirected from the user's directory number to another directory number. Calls are redirected regardless of the busy or idle status of the interface to the user. Call Forward is assigned on the basis of the directory number and call type (i.e., the user may have voice calls forwarded, while data calls terminate normally).

This feature is invoked using the National ISDN-1 Feature Key Management interface. When Call Forward is activated the Feature Activation Information Element (IE) is sent from the base DN to the Meridian 1 system for either feature activation or deactivation.

The Feature Activation IE consists of the feature identifier which represents the combination of the Call Forward feature, the DN, and the call type. There are two methods of feature activation: Call associated; and Non-call associated. In both cases the Feature Activation Information Element is used to activate the feature for the DN and Call Type.

Operating parameters

This feature is based on the Meridian 1 Call Forward All Calls feature; therefore, it is subject to the same limitation as the Meridian 1 Call Forward All Calls feature.

ISDN BRI terminals must support the Feature Key Management protocol.

When a DN from a Terminal Service Profile (TSP) activates or deactivates the Call Forward feature, it applies to all appearances of the same DN from different TSPs on the same Digital Subscriber Loop (DSL). For example, if a boss and a secretary each has their own BRI terminal and the secretary has her boss' DN on her set, when the boss activates Call Forward the call will not be terminated on the secretary's set. If the secretary deactivates the feature, the call will be terminated on the boss' and the secretary's sets.

Data dump does not store the Call Forward numbers and Call Forward status for BRI terminals. Therefore, after SYSLOAD the Call Forward feature is no longer activated and the Call Forward numbers are not saved in the Meridian 1.

There is no confirmation tone provided from the Meridian 1 when the Call Forward feature is invoked from an ISDN BRI terminal.

Only one BRI terminal from a Digital Subscriber Loop (DSL) is allowed to activate or deactivate the Call Forwarding feature at a time. If two BRI terminals try to activate or deactivate at the same time only the first action is allowed. The second terminal is denied the service.

Feature interactions

Call Forward All Calls

Meridian 1 Call Forward All Calls only allows calls to a prime DN or single appearance DN to be forwarded. For the BRI interface, the terminology of prime DN and single appearance DN does not apply. When Call Forward has been activated for a DN and Call Type, calls to the DN/Call Type are forwarded regardless of which Terminal Service Profile (TSP) that the DN/Call Type is assigned. In addition, redirecting information about the BRI terminal is delivered to the remote DN. If the remote DN is an ISDN BRI terminal, the redirecting information is passed in the Redirecting Number IE of the SETUP message to the BRI terminal.

When an ISDN BRI terminal has activated the Call Forward feature, it is treated as if it is a set from the Meridian 1 activating the feature. The Meridian 1 features that are normally applicable to the set will also be applicable to the BRI terminal.

Call Forward No Answer
Busy

As in the case of Call Forward All Calls, the National ISDN 1 Basic Rate Interface (BRI) Call Forward All Calls feature takes precedence over Call Forward No Answer, and Call Forward Busy.

Network Call Redirection

When a call to the BRI interface is forwarded, the redirecting DN and the reason for call redirection are passed to the remote user if the remote user is connected by ISDN. The redirecting information is encoded in the ISDN SETUP message for display purposes. In addition, Call Forward to another node from an ISDN BRI terminal is counted as one for the ISDN network Call Redirection counter which is defined in the customer data block.

Call Forward and Busy Status

This feature is not supported for ISDN BRI terminals.

Remote Call Forward

Remote Call Forward allows a user to program Call Forwarding from a remote set. Call Forwarding remotely to an ISDN BRI terminal is supported. However, using Remote Call Forward from an ISDN BRI terminal is not supported.

Attendant and Network-wide Remote Call Forward

This feature allows the configuration of Call Forward from an Attendant Console and a remote set across a Meridian Customer Defined Network (MCDN). For an ISDN BRI terminal, Remote Call Forward is allowed from a set, or from an Attendant Console, but not from a BRI set either locally or network wide. When Call Forward is activated, it is assumed that the Call Forward for the BRI set is voice, not data.

Internal Call Forward

An ISDN BRI terminal cannot activate the internal Call Forward feature.

Call Forward/Hunt Override via Flexible Feature Code

This feature allows all attendants and sets with Call Forward/Hunt Override Allowed (CFHA) Class of Service to override Call Forward All Calls (CFAC). Since an ISDN BRI terminal cannot access Flexible Feature Codes, it cannot override CFAC on other sets. However, an ISDN BRI set's Call Forward All Calls can be overridden by a set having CFHA Class of Service or by an attendant in both standalone and network environments.

Call Forward Reminder Tone

The Call Forward Reminder Tone is supported on ISDN BRI sets that have the Call Forward All Calls feature active.

Call Forward Confirmation Tone

During activation or deactivation of Call Forward from a BRI terminal, a Call Forward confirmation tone is not provided to the BRI terminal. Instead, confirmation is done by sending an ISDN BRI message to the terminal.

Call Forward Save on SYSLOAD

Call Forward Save on SYSLOAD is not supported for ISDN BRI terminals.

Feature packaging

There is no new feature package introduced by this feature. However, the following feature packages are required for ISDN BRI:

- Basic Rate Interface (BRI) package 216
- Basic Rate Interface line application (235)
- Meridian 1 Extended Peripheral Equipment (XPE) package 203.

Feature implementation

Task summary list

The following is a summary of the tasks to configure ISDN BRI National ISDN-1 Call Forward All Calls:

1 LD 27 – Configure National ISDN-1 protocol for a DSL.

2 LD 27 – Configure Call Forward All Calls in the TSP.

LD 27 – Configure National ISDN-1 protocol for a DSL.

Prompt	Response	Description
REQ	NEW	Add new data.
TYPE	DSL	Digital Subscriber Loop.
DSL	lll s c dsl#	DSL address, for Options 51C, 61C, 81C.
	c dsl#	DSL address, for Option 11C.
...		
PGPN	1	Protocol set group number.
PRID	6	Protocol identification. Enter 6 for National ISDN-1.
...		

LD 27 – Configure Call Forward All Calls in the TSP.

Prompt	Response	Description
REQ	NEW CHG	Add new data. Change existing data.
TYPE	TSP	Administer the Terminal Service Profile on the DSL.
DSL	lll s c dsl#	DSL address (as already entered in step 1).
	c dsl#	DSL address, for Option 11C (as already entered in step 1)

...		
DN	xxxx (0)-N	xxxx = DN to be associated with the TSP. (0)-N = CLID entry, with N = CLID SIZE-1 (SIZE defined in LD 15).
...		
FEAT	CFXA	Allow Call Forward External for the DN.
SSRV_NI	VCFA 15 16	Feature identifiers for Call Forward voice activation.
	VCFD 15 16	Feature identifiers for Call Forward voice deactivation.
	DCFA 16 26	Feature identifiers for Call Forward data activation.
	DCFD 17 27	Feature identifiers for Call Forward data deactivation.
...		

Feature operation

No specific operating procedures are required to use this feature.

ISDN Basic Rate Interface Connected Line Presentation/Restriction

Feature description

ISDN Basic Rate Interface Connected Line Presentation/Restriction is a supplementary service that enables the Meridian 1 to either allow or restrict the presentation of a connected party's ISDN number and sub-address on the display of an ISDN BRI terminal. The presentation of a ISDN number and sub-address to the calling party occurs when the connected party's ISDN BRI terminal answers the call. In addition to the BRI terminal, this service can be applied to Meridian 1 proprietary and Analog (500/2500 type) sets.

The Connected Line Presentation (COLP) service applies to the calling party. COLP allows the presentation of the connected party's ISDN number and sub-address to the calling party.

The Connected Line Restriction (COLR) service applies to the connected party. COLR restricts the presentation of the connected party's ISDN number and sub-address to the calling party. COLR is activated on the ISDN BRI terminal of the connected party.

The connected party's identification is only provided to the calling party, if the ISDN BRI terminal of the connected party supports this feature.

When COLP/COLR feature is activated, the system monitors the configuration of the terminal service profiles on the calling and connected parties ISDN BRI terminals. Depending on this configuration, the system determines whether or not information is allowed or restricted to the calling party.

Operating parameters

Through configuration, the Meridian 1 BRI terminal interface controls the provisioning of the connected party's information on the interface (COLP prompt). This avoids sending COLP when the terminal does not support this supplementary information.

With the presentation restricted option activated, some BRI terminals may not have the capability to restrict the presentation of digits from the connected party. The Meridian 1 BRI terminal interface has the capability to restrict sending the connected party information the calling party if COLR is activated (COLP prompt).

ISDN BRI COLP/COLR coding is based on ETSI protocol. COLP/COLR from or to the public network is available to all countries, using the EuroISDN DSS1 protocol on the BRI interface.

The construction of the ISDN BRI connected number follows the same rules that apply to Calling Line Identification when sending an extension number over the same interface. National and local prefixes can be added. The type of numbering plan can be modified the same way they are modified for other types of terminals.

Feature interactions

Digital Terminal Display

When a calling party's digital terminal with display receives the connected party's information element, the display is updated with the received number depending on the presentation status. The presentation status applies to calls originating from non-ISDN extensions.

ISDN BRI terminals

Depending on the configuration of the Terminal Service Profiles, there is or is not full transparency for connected number and connected sub-address exchange between ISDN BRI terminals.

ISDN Central Office Trunks

When a call from a ISDN Central Office (CO) is answered by a ISDN BRI terminal, the ISDN BRI terminal's connected number is sent over the ISDN CO trunk interface, provided that COLP/COLR service is supported. The existing rules to generate the connected number on the ISDN CO interfaces are not modified by COLP/COLR. With the exception of EuroISDN trunks, the connected number is passed only if a redirection occurs.

ISDN Private Trunks

When a call from a QSIG interface is answered by a ISDN BRI terminal, the ISDN BRI terminal's connected number is sent over the QSIG interface. This connected message is given, even though no prior redirection occurred.

When a call from a Meridian Customer Defined Network (MCDN) interface is answered by a ISDN BRI terminal, the ISDN BRI terminal's connected number is sent over the MCDN interface. A connect message is sent no matter how the D-channel is configured and only after a redirection has occurred.

ISDN Calling Line Identification Enhancement

The ISDN Calling Line Identification Enhancement allows the choice of National and Local prefixes. This is applicable to connected numbers received from a ISDN BRI terminal and sent over a ISDN trunk.

EuroISDN Continuation

The EuroISDN Continuation capability adds National and Local prefixes to the connected number being sent. This is programmed on a route basis and is applicable to connected numbers received from a ISDN BRI terminal and sent over a ISDN trunk.

DPNSS/DASS2

The mapping of the connected number information element in a connect message from or to a ISDN BRI terminal and the connected line identification in a CRM message from or to a DPNSS or DASS2 interface is supported.

Feature packaging

There is no new feature package introduced by this feature. However, the following feature packages are required for ISDN BRI:

- Basic Rate Interface (BRI) package 216
- Basic Rate Interface line application (235)
- Extended Peripheral Equipment (XPE) package 203.

Feature implementation

Task summary list

The following is a summary of the tasks to configure ISDN BRI Connected Line Presentation/Restriction:

1 LD 27 – Configure COLP/COLR for ISDN BRI terminals.

2 LD 27 – Configure Connected Line Presentation/Restriction for a DSL.

LD 27 – Configure COLP/COLR for ISDN BRI terminals.

Prompt	Response	Description
REQ	CHG	Change.
TYPE	TSP	Terminal Service Profile Data.
...		
DN	xxx...x	Directory Number (1 to 7 digits) of ISDN BRI terminal.

- CLIP	(YES) NO	Calling Line Identification Presentation for Incoming Calls.
- PRES	(YES) NO	Presentation of Calling Line Identification to far end on outgoing calls (allowed) restricted.
- COLP	(NO) YES	YES = Connected, number is passed from Meridian 1 to ISDN BRI terminal. NO = Connected, number is not passed from Meridian 1 to ISDN BRI terminal.
- TRANS	(NO) YES	YES = Connected, number is transmitted to the ISDN BRI terminal as received with no modification. NO = Connected, number is transmitted to the BRI terminal after erasing digits within information element. TRANS is only applicable if the connected number received has presentation restricted.

LD 27 – Configure Connected Line Presentation/Restriction for a DSL.

Prompt	**Response**	**Description**
REQ	CHG	Create new data block.
TYPE	DSL	Digital Subscriber Loop.
DSL	lll s c dsl#	DSL address, for Options 51C, 61C, 81C.
	c dsl#	DSL address, for Option 11C.
USID	x	User Service Identifier.
...		
PRID	2	Protocol Identification. Where: 2 = ETSI is only supported.

Feature operation

No specific operating procedures are required to use this feature.

NI-1 BRI Compliance Enhancements

Feature description

This feature enhances the Meridian 1 functional protocol to be compatible with the National ISDN-1 (NI-1) ISDN Basic Rate Interface (BRI) voice and data standard for line application. The NI-1 protocol is configured in Overlay 27, which is used for ISDN BRI administration, by entering “6” against the PRID prompt. This protocol information is downloaded to the Multi-purpose ISDN Signaling Processor’s (MISP) network layer for handling ISDN BRI line application interface with NI-1 compatible terminals.

Another enhancement introduced by this feature is that the alphanumeric value for the Service Profile Identification (SPID) has been expanded from 9 to 20 characters (although the NI-1 standard only requires that the SPID range be from 9-20, the Meridian 1 implementation supports 1-20). The SPID is configured in Overlay 27 (by administering the Terminal Service Profiles) for the network side, and programmed on NI-1 compatible ISDN BRI terminals for the user side (both entries for the SPID must be the same).

Operating parameters

There are no operating parameters associated with this feature.

Feature interactions

There are no feature interactions associated with this feature.

Feature packaging

There is no new feature package introduced by this feature. However, the following feature packages are required for ISDN BRI:

- Basic Rate Interface (BRI) package 216
- Basic Rate Interface line application (235)
- Multi-purpose Serial Data Link (MSDL) package 222

Feature implementation

Task summary list

The following is a summary of the tasks to configure NI-1 BRI Compliance Enhancements:

1 LD 27 – Administer the Terminal Service Profiles (TSPs) on a Digital Subscriber Loop (DSL)

2 LD 27 – Configure the NI-1 protocol for a DSL. Refer to the note above pertaining to selecting the NI-1 protocol on the ISDN BRI terminals.

LD 27 – Administer the Terminal Service Profiles (TSPs) on a Digital Subscriber Loop (DSL)

Prompt	Response	Description
REQ	NEW CHG	Add a TSP. Change a TSP.
TYPE	TSP	Administer the TSP on a DSL.
DSL	lll s c dsl#	DSL address, for Options 51C, 61C, 81C.
	c dsl#	DSL address, for Option 11C.
USID	0-15	User service identifier Set USID = 0 to configure a default TSP for non-initializing terminals. Set USID = 1-15 for initializing terminals, for example, the M5317TDX.
SPID	aaa...a <cr> Xaaa...a	Service profile ID aaa...a = any combination of 1-20 alphanumeric characters. <cr> = Stops this prompt from being displayed again. A maximum of 8 valid SPIDs per TSP are allowed. This prompt appears only if USID = 1-15 (if 0 was entered for the USID, a SPID is not required). This SPID must be programmed in the initializing terminal to associate the terminal with a USID. Refer to the note which follows on page 1704. Xaaa...a = removes the specified SPID.
...		

Note: The ISDN BRI terminal requires that Layer 2 and Layer 3 parameters be programmed at the terminal. When programming the SPID, the voice SPID and data SPID should each match the one entered in LD 27 when administering the TSP which contains the terminal's DN. Also, if the terminal has an option to select the standard protocol, select the NI-1 standard. Refer to your terminal documentation for complete instructions.

LD 27 – Configure the NI-1 protocol for a DSL. Refer to the note above pertaining to selecting the NI-1 protocol on the ISDN BRI terminals.

Prompt	Response	Description
REQ	NEW CHG	Add a TSP. Change a TSP.
TYPE	DSL	Administer the DSL.
DSL	lll s c dsl#	DSL address, for Options 51C, 61C, 81C.
	c dsl#	DSL address, for Option 11C.
PRID	6	Defines the protocol to be used on the DSL. Enter 6 for NI-1. The values for this prompt are: 1=ANSI 2=ETSI 3=DMS 4=NET64 5=NUMERIS 6=NI-1
...		

Feature operation

No specific operating procedures are required to use this feature

Set-based ISDN BRI features on Meridian 1
ISDN BRI terminals

Feature description

The following features are supported on M5317TDX terminals:

- AutoDial Keys (up to 9 keys each with 20 digit numbers)
- Inspect Key
- Data Port Configuration from the menu
- HandsFree
- Conference - Soft Key (recommended key #15)
- DiscData Soft key for Disconnecting Data Calls
- English/French Language Support
- Set based Ringing Patterns
- Set based Clock

The following features are supported on M5209TDcp terminals:

- Last Number Redial (invoked by ##)
- Set based Speed Call (Can store up to five 25 digit numbers)
- Store Number Redial (multiple keys)
- Conference (recommended key #9)
- DiscData Soft key for Disconnecting Data calls
- English/French Language Support
- Set based Ringing Patterns

Operating parameters

There are no operating parameters associated with this feature.

Feature interactions

There are no feature interactions associated with this feature.

Feature packaging

This feature is included in base X11 System Software.

Feature implementation

There are no specific implementation procedures for this feature.

Feature operation

No specific operating procedures are required to use this feature

Generic X11 features on ISDN BRI

Feature description

This section begins with a quick reference table (Table 122) of features with a column that indicates how this feature is supported on ISDN BRI. The notes at the end of the table provide some detail about the support of the feature.

The following legend and notes apply to Table 122.

Legend

yes = fully supported

n/a= Not Applicable or transparent to ISDN BRI

no = not supported due to ISDN BRI Standards limitations

P= partially support with description of limitation

Features labeled with "**" have a more detailed description later in this chapter.

For complete information on these features, refer to the *Features and Services* (553-3001-306).

Note 1: ISDN BRI Terminal can ONLY initiate calls to the user equipped with this feature.

Note 2: ISDN BRI Terminal CAN NOT invoke this feature, however, the non-ISDN BRI calling party (calling an ISDN BRI user) will have access to this feature.

Note 3: Feature is ISDN BRI Terminal dependent.

Note 4: Automatic Number Identification, as used here, refers to the Hotel/Motel ANI feature. Please refer to "Calling Party Number" feature listed above for CLID.

Note 5: Camp-on feature can not be invoked against an ISDN BRI Terminal.

Note 6: Feature is not available to ISDN BRI user, however, ISDN BRI Terminal calling other non-ISDN BRI set equipped with this feature will receive appropriate call handling treatment.

Note 7: ISDN BRI Terminal display, if equipped, will not be updated to reflect call modification.

Table 122
Generic X11 features on ISDN BRI lines (Part 1 of 32)

Features and services	Supported	Comments
— A—		
Access Restrictions**	yes	See details later in this chapter
Access to Paging**	yes	See details later in this chapter
Access to Recorded Telephone Dictation**	yes	See details later in this chapter
Automatic Call Distribution (ACD)**	P	See Note 1 and details later in this chapter.
ACD Answering Time in Night Service	no	
ACD/CDR Q Record Option.	no	
ACD Call Priority	no	
ACD Call Waiting Threshold	no	
ACD Calls on Hold	no	
ACD Enhancements	no	
• Call Delays	no	
• Dynamic Queue Threshold	no	
• Threshold Visual Indication	no	
ACD Least Call Queuing	no	
ACD Night Call Forward without Disconnect Supervision	no	
Activity Codes for Not Ready State	no	
Advice of Charge for EuroISDN**	yes	See details later in this chapter

Table 122
Generic X11 features on ISDN BRI lines (Part 2 of 32)

Features and services	Supported	Comments
Advice of Charge for AXE-10 Australia and Japan D70**	yes	See details later in this chapter
Alternative Conference Pad Levels	yes	
Alternative Loss Plan	yes	
Application Module	n/a	
Asia Pacific CO Connectivity	yes	trunks only
ARIES Automatic Gain Control	n/a	
ARIES Handsfree Download	n/a	
Attendant Administration	no	
Attendant Alternative Answering**	P	See Note 1 and details later in this chapter
Attendant Barge-in	no	
Attendant Blocking of DN**	P	See details later in this chapter
Attendant Break-in	no	
Attendant Busy Verify	no	
Attendant Call Party Name Display.	yes	
Attendant Call Selection	n/a	
Attendant Calls Waiting Indication	n/a	
Attendant Consoles	no	
Attendant Display of Speed Call or Autodial	no	
Attendant End-to-End Signaling**	yes	See details later in this chapter

Table 122
Generic X11 features on ISDN BRI lines (Part 3 of 32)

Features and services	Supported	Comments
Attendant Forward No Answer**	P	See details later in this chapter
Attendant Incoming Call Indicators	n/a	
Attendant Interpositional Transfer	n/a	
Attendant Lockout	n/a	
Attendant Overflow Position**	P	See Note 1 and details later in this chapter.
Attendant Overflow Position Busy	no	
Attendant Position Busy. See also Night Service	n/a	
Attendant Recall**	P	See Note 2 and details later in this chapter.
Attendant Recall with Splitting Optional	no	
Attendant Release**	P	See details later in this chapter.
Attendant Secrecy	yes	
Attendant Splitting	yes	
Attendant Supervisory Console	n/a	
Attendant Trunk Group Busy Indication	n/a	
Audible Message Waiting	yes	See Note 3
Audible Reminder of Held Call	no	
Attendant Through Dialing Network Wide	yes	trunks only
Australia ETSI	yes	
Autodial	yes	See Note 3

Table 122
Generic X11 features on ISDN BRI lines (Part 4 of 32)

Features and services	Supported	Comments
Autodial with Authorization Code	no	
Autodial Tandem Transfer	no	
Automatic Answerback	no	
Automatic Gain Control Inhibit and Handset Volume Reset	no	
Automatic Guard Detection	yes	
Automatic Hold	no	
Automatic Line Selection	yes	See Note 3
Automatic Number Identification	no	See Note 4
Automatic Number Identification on DTI	no	See Note 4
Automatic Preselection of Prime DN	yes	See Note 3
Automatic Redial	no	
Automatic Set Relocation	no	
Automatic Timed Reminders**	P	See Note 5 and details later in this chapter.
Automatic Trunk Maintenance	n/a	
Automatic Wake Up	no	
Automatic Wake Up Flexible Feature Code Delimiter	no	
Auxiliary Processor Link	n/a	
Auxiliary Signaling	no	
— B —		
B-Channel Overload Control	no	
Background Terminal	no	

Table 122
Generic X11 features on ISDN BRI lines (Part 5 of 32)

Features and services	Supported	Comments
Bar Reciprocal Call Forward	no	
Barge-in	no	
Basic Alternate Route Selection	yes	
Basic Authorization Codes	no	
Basic Call, North American ISDN PRI Connectivity**	yes	See details later in this chapter
Bearer Capability in CDR	no	
Boss/Secretary Filtering Enhancement	no	
Break-in Features • Break-in to inquiry calls • Break-in to line lockout denied	no	
Bridging	no	
Business Networking Express/EuroISDN Call Diversion	P	Supported over BRIT trunks, but not on BRI sets
Business Networking Express/EuroISDN Explicit Call Transfer	yes	
Business Networking Express/EuroISDN Name and Private Number Display	yes	
Busy Lamp Field Array	no	
Busy Tone Detection for APAC and CALA	no	
Busy Tone Detection for Japan	no	
Busy Tone to Night DN on Busy DN**	P	See details later in this chapter

Table 122
Generic X11 features on ISDN BRI lines (Part 6 of 32)

Features and services	Supported	Comments
Busy Verify on Calling Party Control	no	
Buzz - See Manual Signaling (Buzz)	no	
— C —		
Call-Back Queuing	no	
Call-Back Queuing/Conventional Main	no	
Call Capacity Report Enhancement	no	
Call Connection Restriction	yes	
Call Detail Recording	yes	
Call Detail Recording Enhancement	no	
Call Detail Recording Expansion	yes	
Call Detail Recording 100 Hour Call	no	
Call Detail Recording on Busy Tone	yes	
Call Detail Recording Outpulsed Digits	no	
Call Detail Recording with Optional Digit Suppression	yes	
Call Forward All Calls**	P	See details later in this chapter
Call Forward and Busy Status	no	
Call Forward, Break-in and Hunt Internal or External Network Wide	no	
Call Forward Busy	yes	See ISDN BRI Special Call For Busy
Call Forward Destination Deactivation	yes	
Call Forward External Deny	no	

Table 122
Generic X11 features on ISDN BRI lines (Part 7 of 32)

Features and services	Supported	Comments
Call Forward/Hunt Override via FFC**	P	See details later in this chapter
Call Forward and Hunt by Call Type**	yes	See details later in this chapter
Call Forward No Answer**	yes	See details later in this chapter
Call Forward No Answer/ Flexible	yes	See Note 7
Call Forward/Save on Dump	no	
CFNA, Second Level for MWA stations	yes	See Note 7
Call Forward No Answer, Second Level	yes	See Note 7
Call Forward to Trunk Restriction	yes	
Call Hold**	yes	See details later in this chapter
Call Hold, Deluxe	no	
Call Hold, Individual Hold Enhancement	no	
Call Hold, Permanent	no	
Calling Line Identification**	P	See details later in this chapter
Calling Line Identification on Analog Trunks for Singapore, Australia, and Hong Kong (A-CLID)	P	Supported over BRIT trunks
Calling Line Identification Presentation	yes	See details later in this chapter
Calling Line Identification Restriction	yes	See details later in this chapter
Call Page Network Wide	yes	

Table 122
Generic X11 features on ISDN BRI lines (Part 8 of 32)

Features and services	Supported	Comments
Calling Party Privacy	no	
Calling Party Privacy Override	no	
Call Park**	P	See details later in this chapter
Call Park Network Wide	no	
Call Park on Unsupervised Trunks	no	
Call Party Name Display**	P	See details later in this chapter
Call Pickup	no	
Call Pickup, Directed	no	
Call Pickup Network Wide	no	
Call Processor Card NT5D10	n/a	
Call Redirection by Day	no	
Call Selection	n/a	
Call Splitting	yes	
Call Status Indication	n/a	
Call Transfer**	P	See Note 2 and details later in this chapter
Call Waiting/Internal Call Waiting**	yes/yes	See details later in this chapter
Called Party Control on Internal Calls	no	
Called Party Disconnect Control**	P	See details later in this chapter
Calling Line Identification**	P	See details later in this chapter

Table 122
Generic X11 features on ISDN BRI lines (Part 9 of 32)

Features and services	Supported	Comments
Calling Line Identification Presentation and Restriction**	yes	See details later in this chapter
Calling Party Number	yes	
Calling Party Privacy Override	no	
Charge Account and Calling Party No	yes	See Note 1
Calls Waiting Indication (Attendant)	n/a	
CAMA Trunks	no	
Camp-on	no	
Camp-on to Multiple Appearance DN	no	
Capacity Expansion	yes	
Card LED Status	no	
Centralized Multiple Line Emulation	no	
Centrex Switchhook Flash	no	
Code Restriction	yes	
Charge Account and Calling Party Number **	P	See details later in this chapter
Charge Account, Forced	no	
Charge Display at End of Call	no	
China #1 Signaling Features**	P	See details later in this chapter
CIS ANI Reception	yes	sets only
CIS ANI Digit Manipulation and Gateway Enhancement	yes	
CIS Multifrequency Shuttle	no	

Table 122
Generic X11 features on ISDN BRI lines (Part 10 of 32)

Features and services	Supported	Comments
CIS Toll Dial Tone Detection	no	
CLASS: Calling Number and Name Delivery	no	
CLASS: Visual Message Waiting Indicator	no	
Class of Service	yes	
CO Trunk Priority Option - Call Pickup	no	
Conference	no	See Note 2
Conference Control	n/a	
Console Digit Display	n/a	
Console Presentation Group Level Services	no	
Control of Trunk Group Access	n/a	
Controlled Class Of Service	no	
Controlled Class of Service, Enhanced	no	
Coordinated Dialing Plan	yes	
Coordinated Call-Back Queuing	no	
Coordinated Call-Back Queuing - Main	no	
— D —		
Data access via Data Modules	P	See Note 2
Data Port Hunting	yes	
Data, Circuit Switched**	yes	See details later in this chapter
Data, Packet**	yes	See details later in this chapter

Table 122
Generic X11 features on ISDN BRI lines (Part 11 of 32)

Features and services	Supported	Comments
D-Channel Expansion	no	
Default Loss Plan	yes	
Deluxe Hold	no	
Departmental Listed Directory Number (LDN)**	yes	See details later in this chapter
Dial Access to Group Call	no	
Dial Intercom	no	
Dial Pulse/Dual Tone Multifrequency Conversion	n/a	
Dial Tone Detection	no	
Dialed Number Identification Service	P	See Note 7
DID to Network Calling	yes	
Digit Display	yes	See Note 7
Digital Private Networking Signaling System 1 (DPNSS1)	no	
Digital Trunk Interface	yes	
Direct Inward System Access	yes	
Directed Call Pickup	no	
Directory Number	yes	
Directory Number Expansion**	yes	See details later in this chapter
DISA on Unsupervised Trunks	no	
Display of Access Prefix on CLID	yes	trunks only
Display of Calling Party Denied	no	

Table 122
Generic X11 features on ISDN BRI lines (Part 12 of 32)

Features and services	Supported	Comments
Distinctive/New Distinctive Ringing	no	
Distinctive Ringing by DN	no	
Distinctive Ringing for Dial Intercom	n/a	
Distinctive Ringing Network Wide	no	
Do Not Disturb**	yes	See details later in this chapter
DNIS Length Flexibility	no	
DSN Station Loop Preemption	no	
Dual Value Added Server Identification	n/a	
— E—		
E.164/ESN Numbering Plan Expansion	yes	
Electronic Brandlining	no	
Electronic Switched Network	yes	
Emergency Services Access	yes	
End Dialing on Direct Inward/Outward Dialing	yes	
End of Selection	yes	
End of Selection Busy	yes	
End-to-End Signaling	yes	
Enhanced Charge Display	no	
Enhanced Controlled Class of Service	no	
Enhanced End-to-End Signaling	yes	
Enhanced Flexible Hot Line**	P	See Note 2

Table 122
Generic X11 features on ISDN BRI lines (Part 13 of 32)

Features and services	Supported	Comments
Enhanced Malicious Call Trace	no	
Enhanced Music	yes	
Enhanced Night Service	no	
Enhanced 911 Interface	no	
Enhanced Secrecy	no	
Electronic Lock Network Wide/Electronic Lock on Private Lines	no	
Equal Access Compliance	yes	
ESN Queuing	no	
EuroISDN**	yes	See details later in this chapter
EuroISDN 7kHv/Videotelephony Teleservices	yes	
EuroISDN Continuation	yes	
EuroISDN Continuation Phase III	yes	trunks only
EuroISDN ETS 300 403 Compliance	yes	
EuroISDN Malicious Call Identification	yes	trunks only
EuroISDN Network Side	yes	
Exclusive Hold	no	
Executive Distinctive Ringing	no	
— F —		
510 Trunk Route Member Expansion	yes	
Fast Tone Digit Switch	n/a	

Table 122
Generic X11 features on ISDN BRI lines (Part 14 of 32)

Features and services	Supported	Comments
FCC Compliance for DID Answer Supervision	n/a	
FCC Compliance for Equal Access	yes	
FCC Compliance for Equal Access - CAC Expansion	no	
First-Second Degree Busy Indication	no	
Flexible Attendant DN	n/a	
Flexible Call Forward No Answer	yes	
Flexible Attendant Call Waiting Threshold	no	
Flexible Direct Inward Dialing	no	
Flexible Busy Tone Timer	no	
Flexible Dial Tone Detection	no	
Flexible Direct Inward Dialing	no	
Flexible ESN "0" Routing	yes	
Flexible Hot Line	P	See Note 2
Flexible Feature Codes	no	
Flexible Key Assignment	no	
Flexible Line Lockout	no	
Flexible Numbering Plan	no	
Flexible Numbering Plan Enhancement	no	
Flexible Orbit Prevention Timer	yes	
Flexible Tone and Digit Switch Control	no	
Flexible Tones and Cadences	no	

Table 122
Generic X11 features on ISDN BRI lines (Part 15 of 32)

Features and services	Supported	Comments
Flexible Voice/Data Terminal Number	no	
Forced Camp-on**	P	See details later in this chapter
Forced Charge Account	no	
Forward No Answer Call Waiting for DID	no	
— G —		
Global CDR Record	no	
Global Line Cards	no	
Group Call	no	
Group Hunt**	P	See details later in this chapter
Guest Entry of Automatic Wake Up	no	
— H —		
History File	yes	
Hot Line	P	See Note 2
Hold	yes	Not supported by 1TR6 protocol
Hold Features • Automatic Hold • Held Call Clearing		
Hospitality Screen Enhancements	no	
Hotel/Motel features	no	
• Automatic Wake-Up	no	
• Background Terminal	no	

Table 122
Generic X11 features on ISDN BRI lines (Part 16 of 32)

Features and services	Supported	Comments
• Controlled Class of Service	no	
• Maid ID	no	
• Property Mgmt. Sys. Interface	no	
• Room Service	no	
Hunting	yes	
Hunting by Call Type	yes	
Hunting and Speed Call Features**	P	See details later in this chapter
— I, J—		
Idle Extension Notification	no	
IMS/VMS**	P	See details later in this chapter
In-Band ANI	n/a	
Incoming DID Digit Conversion**	P	See Note 7 and details later in this chapter
Incremental Software Management**	yes	See details later in this chapter
Incoming Call Indicators	n/a	
Incoming Trunk Group Exclusion	n/a	
Incoming Trunk Programmable CLID	n/a	
India Phase II	no	
Individual Hold	no	
INIT ACD Queue Call Restore	no	
Inspect key	yes	See Note 3

Table 122
Generic X11 features on ISDN BRI lines (Part 17 of 32)

Features and services	Supported	Comments
Instant ISM	no	
Integrated Messaging System Link	P	See IMS/IVMS
Integrated Voice and Data	yes	
Intercept Computer Interface Dial From Directory	no	
Intercept Computer Enhancements		
• Answering Machine enhancements	yes	
• Malicious Call Trace DN and TN print	yes	
• Call Forward interaction control**	P	See details later in this chapter
Intercept Computer Interface**	P	See details later in this chapter
Intercept Treatment**	yes	See details later in this chapter
Intercept Treatment Enhancement	no	
Interchangeable NPA	no	
Internal Call Detail Recording	yes	
Internal Call Waiting	yes	
Interpositional Transfer	n/a	
Inventory Reporting	no	
IPE Completion	no	
IPE Loss Plan for China	no	
ISDN Application Protocol	no	
ISDN Call Connection Limitations	yes	

Table 122
Generic X11 features on ISDN BRI lines (Part 18 of 32)

Features and services	Supported	Comments
ISDN BRI Calls to MCA/MCU	yes	
ISDN BRI Circuit- Switched Data Call Accessing DTI Trunk	yes	
ISDN BRI Connected Line Presentation/Restriction	yes	
ISDN BRI to ISDN BRI Circuit Switched Data Call	yes	
ISDN BRI Circuit-Switched Data Call over PRI	yes	
ISDN BRI Circuit- Switched Data Call for Tandem	yes	
ISDN BRI Network Ring Again	yes	
ISDN NI-1 BRI Compliance Enhancements	yes	
ISDN BRI Special Call Forward Busy	yes	
ISDN BRI Special Hunting	yes	
ISDN BRI Trunk Access for Japan	yes	
ISDN Calling Line Identification Enhancements	yes	
ISDN QSIG Alternate Routing	no	
ISDN QSIG Basic Call	yes	
ISDN QSIG Call Completion	no	
ISDN QSIG Call Completion Enhancement	no	
ISDN QSIG Call Diversion Notification	yes	BRI sets are supported.

Table 122
Generic X11 features on ISDN BRI lines (Part 19 of 32)

Features and services	Supported	Comments
ISDN QSIG Call Diversion Notification Enhancement	yes	BRI sets are supported.
ISDN QSIG Call Transfer Notification	yes	BRI sets are supported.
ISDN QSIG Generic Functional Transport	no	
ISDN QSIG/ETSI Generic Functional Transport Enhancement	no	
ISDN QSIG/EuroISDN Call Completion	yes	
ISDN QSIG/EuroISDN Call Completion Enhancement	yes	
ISDN QSIG Name Display**	P	See details later in this chapter
ISDN QSIG Path Replacement	yes	trunks only
ISDN QSIG Supplementary Services - Name Display Enhancements**	yes	
ISDN Semi-permanent Connection for Australia	no	
ISM Enhancements	no	
Italian Phase 2 Features for DTI2	no	
Japan (D70) PRI nB+D	no	
Japan TTC Common Channel Signaling	no	
— L —		
Last Number Redial	yes	See Note 3
Limited Access to Overlays	yes	
Line Load Control	no	

Table 122
Generic X11 features on ISDN BRI lines (Part 20 of 32)

Features and services	Supported	Comments
Line Lockout	no	
Listed Directory Numbers	n/a	
Lockout	n/a	
Loop Start Supervisory Trunks	no	
Loop Start Supervisory Trunks (incoming calls)	no	
— M —		
Maid Identification	no	
Maintenance Telephone	no	
Make Set Busy	no	
Make Set Busy Enhancement	no	
Make Set Busy Improvement	no	
Malicious Call Trace**	P	See Note 2 and details later in this chapter
Malicious Call Trace Enhancement	no	
Malicious Call Trace Idle	no	
Malicious Call Trace on DID	no	
Manual Line Service	n/a	
Manual Service Recall to Attendant	no	
Manual Signaling (Buzz)	no	
Manual Trunk Service	yes	
MCDN Alternate Routing	no	
MCDN End to End Transparency	no	

Table 122
Generic X11 features on ISDN BRI lines (Part 21 of 32)

Features and services	Supported	Comments
Meridian 1 Attendant Console Enhancement	n/a	
Meridian 1 to New Zealand NEAX-61 ISDN PRI connectivity**	yes	See details later in this chapter
Meridian Communications Adapter (MCA) Data Module**	P	See details later in this chapter
Meridian Companion Enhanced Capacity	N/A	
Meridian Hospitality Voice Services	no	
Meridian Mail Trunk Access Restriction	no	
Meridian MAX	n/a	
Meridian Mail	yes	Audible Indication
Meridian Mail Trunk Access Restriction**	P	See details later in this chapter
Message Center**	P	See details later in this chapter
Message Intercept	no	
Message Registration	no	
Message Waiting Lamp Maintenance	no	
Message Waiting Indicator by Directory Number	no	
Message Waiting (Meridian Mail)**	yes	See Note 3 and details later in this chapter
Message Waiting Unconditional	no	
Modem Trunk Hunting	no	
MSDL Idle Code Selection	N/A	

Table 122
Generic X11 features on ISDN BRI lines (Part 22 of 32)

Features and services	Supported	Comments
MSDL Port Overload Counter	N/A	
MSDL Status Enquiry Message Throttle	N/A	
Multifrequency Compelled Signaling Features**	P	See details later in this chapter
Multiple Appearance Directory Number (DN)**	P	On the same DSL only. See details later in this chapter
Multiple Appearance Redirection Prime	no	
Multi Language Messages	no	
Multi-Language Wake Up	no	
Multi-Party Operation**	p	See details later in this chapter
Multiple-Customer Operation	yes	
Multiple-Console Operation	n/a	
Multiple DID Office Code Screening	n/a	
Multiple-Tenant Service	no	
Multi-Site Mobility Networking	no	
Music	yes	
Music Broadcast	no	
Music, Enhanced	yes	
Music on Hold**	yes	See details later in this chapter
— N —		
N Digit DNIS	no	
Network Anti-tromboning	no	

Table 122
Generic X11 features on ISDN BRI lines (Part 23 of 32)

Features and services	Supported	Comments
Network Application Protocol Link Enhancement	no	
Network Automatic Call Distribution	P	See Note 1
Network Alternate Route Selection**	yes	See details later in this chapter
Network Attendant Service**	p	See details later in this chapter
Network Authorization Codes	no	
Network Call Party Name Display	P	
Network Call Pick-up and TAFAS	no	
Network Call Transfer**	P	See Note 2 and details later in this chapter
Network Call Redirection Service**	P	See details later in this chapter
Network Call Trace and Call Diagnostics	no	
Network Class of Service**	yes	See details later in this chapter
Network Drop Back Busy and Off-hook Queuing	yes	
Network Individual Do Not Disturb	no	
Network Intercom	no	
Network Message Center	P	See Message Center
Network Message Services (Meridian Mail)	yes	
Network Ring Again	no	
Network Signaling	yes	

Table 122
Generic X11 features on ISDN BRI lines (Part 24 of 32)

Features and services	Supported	Comments
Network Signaling on VNS	no	
Network Signaling for Network ACD**	P	See details later in this chapter
Network Speed Call	P	See Note 2
Network Tenant Service	no	
Network Traffic	n/a	
Network Wide LDN**	P	See details later in this chapter
Networking Features**	P	See details later in this chapter
New Distinctive Ringing	no	
New Flexible Code Restriction	yes	
NI-2 Call By Call Service Selection	no	
Night Key for DID Digit Manipulation	no	
Night Service/TAFAS**	P	See Note 1 and details later in this chapter
Night Service Improvements	P	See details later in this chapter
Night Service by Time of Day	P	See Note 6
No Hold Conference	P	See Note 2
NPI and TON in CDR tickets	no	
— O —		
Off-Hook Alarm Security	no	
Off-Hook Queuing	no	
Off-Net Number Recognition	yes	

Table 122
Generic X11 features on ISDN BRI lines (Part 25 of 32)

Features and services	Supported	Comments
Off-Premise Extension	n/a	OPX — applicable to analog sets only
Office Data Administration System	no	
On Hold on Loudspeaker	no	
On-Hook Dialing	yes	See Note 3
Option 11 Downloadable D-channel	n/a	
Option 11 Set based installation	no	
Optional Outpulsing Delay	no	
Optional Privacy	no	
Outgoing Trunk Hunting	n/a	
Overflow Tone	yes	
Overlap Signaling	yes	
Overlay Cache Memory	yes	
Override	no	
Outpulsing of Asterisk and pound**	yes	See details later in this chapter
— P —		
Packet Switched Data Service	yes	Supported for both B and D channels
Paging	yes	
Partial Dial Timing	no	
Periodic Camp-on Tone	no	
Periodic Clearing	no	

Table 122
Generic X11 features on ISDN BRI lines (Part 26 of 32)

Features and services	Supported	Comments
Periodic Pulse Metering**	P	See details later in this chapter
Permanent Hold	n/a	
Phantom TNs	no	
Position Busy	n/a	
Preference Trunk Usage	yes	
Pretranslation**	yes	See details later in this chapter
Pretranslation and System Speed Call Enhancement	no	
Preventing Reciprocal Call Forward	no	
Prime DN	n/a	
Priority Override**	p	See details later in this chapter
Privacy	no	
Privacy Override	no	
Privacy Release	no	
Private Line Service	no	
Private to Public CLID Conversion	no	
Process Notification for Networked Calls	no	
Property Management System Interface	no	
Pulsed E&M DTI2 Signaling	no	
— R —		
Radio Paging Improvements**	P	See details later in this chapter

Table 122
Generic X11 features on ISDN BRI lines (Part 27 of 32)

Features and services	Supported	Comments
Radio Paging Product Improvement Continuation	no	
Recall (Attendant)**	P	See Note 2 and see details later in this chapter
Recall After Parking	no	
Recall to Same Attendant**	P	See details later in this chapter
Recall with Priority During Night Service	yes	
Recorded Announcement**	yes	See details later in this chapter
Recorded Announcement Broadcast	no	
Recorded Announcement for Calls Diverted to External Trunks**	P	See details later in this chapter
Recorded Overflow Announcement	yes	
Recorded Telephone Dictation	yes	
Recovery on Misoperation at the Attendant Console	no	
Remote Call Forward	no	
Remote Peripheral Equipment	no	
Remote Virtual Queuing	no	
Restricted Call Transfer	no	
Restricted DID Class of Service	yes	
Ring Again	no	
Ring Again on No Answer	no	

Table 122
Generic X11 features on ISDN BRI lines (Part 28 of 32)

Features and services	Supported	Comments
Ring and Hold Lamp Status	no	
Ringing Change Key	no	
Ringing Number Pickup	no	
RPE (2Mb) Alarm Handling	no	
R2 Multifrequency Compelled (MFC) Signaling	yes	
R2 MFC Selective Route to Attendant	yes	
R2 MFC CNI/CDR Enhancements	yes	
R2 MFC Timer Control	no	
Room Status	no	
Round Robin Trunk Hunting	n/a	
— S —		
7 Digit DNIS for MAX	n/a	
Schedule Access Restriction	no	
Secrecy (Attendant)	yes	
Secretarial Filtering	no	
Selectable Conferee Display and Disconnect	no	
Semi-automatic Camp-on	no	
Semi-compelled MFC and Calling Number Identification Changes	no	
Series Call	no	
Seizure Acknowledgment	yes	
Selectable Directory Number Size	yes	

Table 122
Generic X11 features on ISDN BRI lines (Part 29 of 32)

Features and services	Supported	Comments
Short Buzz for digital sets	n/a	
Signal source and destination	no	
Single Appearance DN	yes	
Single Digit Access to Hotel Services	no	
Six Party Conference for 2500 Sets	yes	See Note 3
Slow Answer Recall Modification	yes	
Software Capacity Expansion	yes	
Source Included When Attendant Dials	no	
Spanish KD3 DID/DOD Interface	no	
Special Dial Tone	P	Message Waiting Indication
Special Dialtone after Dialed Numbers**	P	See details later in this chapter
Special Service prefix (SPRE)	no	
Speed Call	P	See Note 2
Speed Call DN Access	no	
Speed Call Delimiter	no	
Speed Call on Private Lines	no	
Speed Call with Authorization Codes	no	
Speed Call, System	no	
Splitting** (See Attendant Splitting)	yes	See details later in this chapter
Standalone Meridian Mail	no	
Station Activity Record	yes	

Table 122
Generic X11 features on ISDN BRI lines (Part 30 of 32)

Features and services	Supported	Comments
Station Category Indication	no	
Station Hunting--see ISDN BRI special hunting	yes	
Station Loop Preemption	no	
Station Camp-on	no	
Station-to-Station-Calling	yes	
Station-to-Station Call Waiting	yes	
Stored Number Redial	yes	See Note 3
Supervised CO Trunk Simplification		
Supervisory Attendant Console	n/a	
System Capacity Expansion	yes	
Switched 56 Kbps Service**	P	See details later in this chapter
— T —		
10/20 Digit ANI on 911 Calls	no	
Taiwan R1 Modified Signaling	yes	sets only
Telelink Mobility Switch	no	
Telset Call Timer Enhancement	no	
Time and Date	yes	See Note 3
Time Forced Disconnect** (See Paging)	yes	See details later in this chapter
Tones, Flexible Incoming	no	
Tone to Last Party	no	

Table 122
Generic X11 features on ISDN BRI lines (Part 31 of 32)

Features and services	Supported	Comments
Transfer**	P	See Note 2 and details for Call transfer later in this chapter
Transfer Tone	no	
Trunk Answer From Any Station	no	
Trunk Anti-Tromboning	no	
Trunk Barring	yes	
Trunk Direct Inward Dialing Digitone Receiver Acknowledgment	no	
Trunk Failure Monitor	no	
Trunk Group Access Restrictions (TGAR)	yes	
Trunk Group Busy Keys/Indication**	yes	See details later in this chapter
Trunk Hook Flash Enhancement	no	
Trunk Hunting	n/a	
Trunk Signaling Arrangements	n/a	
Trunk to Trunk Connection	no	
Trunk Verification from a Station	no	SPRE codes are not supported
— U —		
Uninterrupted Line Connections	no	
Uniform Dialing plan	yes	
Universal ISDN Protocol Engine	yes	

Table 122
Generic X11 features on ISDN BRI lines (Part 32 of 32)

Features and services	Supported	Comments
— V —		
Variable Flash Timing and Ground Button	no	
Variable Guard Timing	yes	
VIP Wake up	no	See Automatic Wake Up
Virtual Network Services	yes	
Virtual Network Services in the UK with DASS2/DPNSS1 Bearers	no	
Virtual Network Services Virtual DN Expansion	no	
Voice Call	yes	See Note 3
Voice Call Override	no	

The following descriptions provide additional information for the features tagged with "**" in Table 122. These descriptions provide further details of the interaction of the feature with ISDN BRI.

Access Restrictions

Access restriction for an ISDN BRI terminal is based on assigned class of service, trunk group access restriction, and area and exchange codes dialed by the terminal.

Class-of-service and trunk group access restriction for an ISDN BRI terminal are defined when configuring DSL using Service Change ISDN BRI Program LD 27.

The same access restrictions apply to all voice and data ISDN BRI DNs defined for a DSL.

Access to Paging

An ISDN BRI terminal can access paging equipment by dialing a paging trunk access code. End-to-end signaling must be provided by the ISDN BRI terminal.

Access to Recorded Telephone Dictation

An ISDN BRI terminal can access dictation equipment by dialing an equipment access code. End-to-end signaling must be provided by the ISDN BRI terminal.

Attendant End-to-End Signaling

This feature is supported for ISDN BRI terminals where the attendant can signal to an ISDN BRI terminal and an ISDN BRI terminal can dial the attendant and request access to services requiring end-to-end signaling.

Call Forward No Answer

This feature is supported for calls originated by an ISDN BRI terminal and calls terminated at an ISDN BRI terminal. Internal and external call forward no answer DNs are defined in the DSL, and call forward no answer enable and call forward by call type are defined for ISDN BRI DNs in the TSP using Service Change ISDN BRI Program LDþ27.

An ISDN BRI DN can be defined as a call forward no answer DN allowing the features available on the ISDN BRI terminal to control the call.

Call forward no answer and second level call forward no answer are activated if FNA and SFA are selected for a DN when configuring the TSP using Service Change ISDN BRI Program LD 27. If a call is not answered after a predetermined timer expires, the initial call setup is released from the DSL and call forward no answer routes the call to an alternate DN.

An ISDN BRI terminal originating the call is not updated to show on its display that the call was redirected to a different DN as a result of call forward no answer. This is due to lack of standard for layer 3 messages used to update the ISDN BRI terminal display

Call Hold (not supported by 1TR6 protocol)

This feature is activated by pressing the Hold key on the terminal. This feature allows an ISDN BRI terminal to place an active call on hold to accept or originate another call. You can dial a new call and go back to the call on hold.

An ISDN BRI terminal can place an ISDN BRI or non-ISDN BRI terminal on hold.

Deluxe hold and permanent hold do not apply to an ISDN BRI terminal, however a non-ISDN BRI terminal can place an ISDN BRI terminal in deluxe hold or permanent hold.

Call Waiting

This feature alerts a busy ISDN BRI terminal that a call is waiting to be answered. To answer a waiting call, the ISDN BRI terminal must place the active call on hold or release the active call. If the ISDN BRI terminal user tries to answer a call waiting call when no B-channel is available, the call is released from the ISDN BRI terminal and extended to the attendant.

When both B-channels on a DSL are busy, an incoming call is presented to the DSL as call waiting as long as the number of calls on this DSL does not exceed the maximum number of calls specified, which include active calls, calls waiting, and calls on hold. This maximum number of simultaneous calls allowed is specified when configuring the DSL using Service Change ISDN BRI Program LD 27.

A call waiting from an ISDN BRI terminal is presented to a non-ISDN BRI terminal as a normal call waiting call.

Call waiting for a call terminating at a DSL will be activated only if do-not-disturb and hunting for this DSL are not enabled or fail to handle the call. ISDN BRI call waiting is subject to call forward no answer as defined in the Meridian 1.

Departmental LDN

This feature allows specified terminals to share the same numbering plan and to access the attendant console or consoles dedicated to a departmental LDN.

Directory Number Expansion

ISDN BRI terminal DNs can be increased from a maximum length of four digits to a maximum length of seven digits when the DN Expansion option is equipped.

Do-Not-Disturb

The attendant can place an ISDN BRI DN in do-not-disturb mode, which allows the terminal to make outgoing calls but it makes it look busy to incoming calls.

Incremental Software Management

Software pricing is implemented based on the number of ISDN BRI DSLs (United States only).

Intercept Treatment

A call originated by an ISDN BRI terminal that is intercepted can be routed to the attendant, given a busy tone, given an overflow tone, or routed to a recorded announcement. There is no special treatment for ISDN BRI terminals.

Message Waiting (Meridian Mail)

This feature is supported by ISDN BRI terminals if this feature is enabled for an ISDN BRI DN when configuring the TSP using Service Change ISDN BRI Program LD 27. Audible message is supported, however visual message display indicator is not supported due to lack of standards for layerþ3 messages.

When an ISDN BRI terminal with an active message waiting initiates a call, the system replaces the standard dial tone with a message waiting tone to alert the user that a message is waiting. If a terminal cannot get a dial tone, it also cannot get a message waiting tone.

A call terminating at an ISDN BRI DN can be redirected to Meridian Mail or Network Message Services-Meridian Mail (NMS-MM) through call forward no answer. A call originating from an ISDN BRI terminal to a non-ISDN BRI terminal can also be redirected to Meridian Mail or NMS-MM through call redirection on the non-ISDN BRI terminal.

An ISDN BRI terminal can access the mailbox and retrieve its messages by dialing Meridian Mail or NMS-MM DN. An ISDN BRI terminal does not have a message waiting or conference key.

An ISDN BRI terminal connected to Meridian Mail or NMS-MM cannot use Call Sender feature.

Message waiting forward busy redirects a DID call from a busy DSL interface to Meridian Mail or NMS-MM through FDN defined for a DSL. This feature is enabled on a customer basis for an ISDN BRI DN by setting call forward busy allowed and message waiting allowed class of services when configuring the TSP using Service Change ISDN BRI Program LD 27.

Music on Hold

ISDN BRI terminals on hold and terminals placed on hold by an ISDN BRI terminal can receive music if so configured. An ISDN BRI terminal can also access a music trunk by dialing the route access code.

Network Wide Listed Directory Numbers

This feature enables LDNs to be recognized network wide when Network Attendant Service (NAS) is used. The same LDNs must be configured in multiple nodes. Network LDN is defined on a customer basis.

This feature is supported over ISDN BRI trunk DSLs.

Pretranslation

An ISDN BRI DN can be assigned to a first digit pretranslation group.

The first digit dialed on an ISDN BRI terminal can be pretranslated into a DN while making a call.

Pretranslation is configured for a DSL therefore all DNs for a DSL are assigned to the same pretranslation group.

An ISDN BRI DN can also be assigned as a translated DN in a pretranslation group's speed call list.

Recorded Announcement

An ISDN BRI terminal can be connected to a recorded announcement machine by an intercept condition, by the attendant, by an ACD agent, or by direct access to a recorded announcement machine.

Departmental listed directory number groupings are supported for ISDN BRI and are configured for a DSL using Service Change ISDN BRI Program LD 27. This allows assignment of a DSL to one of the four listed directory number groups. All DNs for a DSL are assigned to the same departmental LDN.

Network Alternate Route Selection

ISDN BRI terminals can have the following networking capabilities: simple network access codes, uniform dialing plan, digit manipulation, automatic least-cost routing, time-of-day routing, automatic on-net to off-net overflow, network control through network class of service, traveling class of service and facility restriction level, routing control through network class of service based on time-of-day schedule, 11 digit translation, free calling area screening, expensive route warning tone, network call detail recording, and network speed dial.

Network Class of Service

An ISDN BRI DSL can be assigned a network class of service to control access to routes, ability to receive expensive route warning tone, and ability to access network speed dial. All DNs for a DSL are assigned to the same NCOS.

Outpulsing of Asterisk and Outpulsing of Pound

Routes can be dedicated for the outpulsing of asterisks (*) and pound (#) when an ISDN BRI terminal is making a trunk call.

Splitting

The attendant selectively talks to either party of an established call made by an ISDN BRI terminal by excluding one party from the conversation or the other using the Exclude Source or Exclude Destination key.

Timed Forced Disconnect

An ISDN BRI terminal is disconnected if it uses the paging trunk longer than a preset time.

Trunk Group Busy Keys/Indication

When all trunks in a trunk group or its hunting groups are busy, a user-selectable tone is returned to the calling ISDN BRI terminal.

Operating parameters

There are no operating parameters associated with this feature.

Feature interactions

There are no feature interactions associated with this feature.

Feature packaging

This feature is included in base X11 System Software.

Feature implementation

There are no specific implementation procedures for this feature.

Feature operation

No specific operating procedures are required to use this feature.

Features partially supported by ISDN BRI

Feature description

The following descriptions provide additional information for the features tagged with “P” and/or “**” in Table 122.

Attendant features

Attendant Alternative Answering

An ISDN BRI DN cannot be assigned as an attendant alternative answering DN. Calls originating from an ISDN BRI terminal can be forwarded to an attendant alternative answering DN defined for the attendant console when the attendant does not answer the call. The originating ISDN BRI terminal display is not updated.

Attendant Blocking of DN

This feature allows a person to dial the attendant DN and request an external (long distance) call, and then disconnect while waiting for the call to be processed by the attendant. The requesting DN is idle and can receive and make calls.

When the attendant is ready to make the external (long distance) call, the Attendant Blocking of DN feature provides the attendant with the ability to block the DN while the external call request is being processed. The line appears busy to any caller attempting to contact the blocked DN. The blocked DN cannot be used to originate a call and will be connected to the attendant if it goes off hook. When the attendant has completed the external call, the blocked DN can be rung and the call extended. The attendant is guaranteed that the requesting DN is not busy and is available to take the call when the processing has been completed. This feature works in both standalone and Meridian Customer Defined Network (MCDN) environments.

This feature is supported over ISDN BRI trunks in an MCDN environment, if NAS is equipped. It is not supported if a call is extended to an ISDN BRI set.

Attendant Forward No Answer

This feature allows calls that are not answered by an attendant within a defined period of time, to be routed to the night DN or to another attendant. It also allows DID call that are not answered within a defined period of time, to be disconnected.

This feature is transparent to calling ISDN BRI terminals. However, originating a call routed by Attendant Forward No Answer cannot be updated. Also, an ISDN BRI terminal cannot be defined as a night terminal.

Attendant and Network Wide Remote Call Forward

This enhancement introduces the RCFW feature across the Meridian Customer Defined Network (MCDN), while also providing the attendant with RCFW capabilities.

The feature capabilities of the set-based (FFC activated) network wide application of the RCFW feature match those of the current standalone RCFW feature.

This feature is supported over ISDN BRI trunks within an MCDN environment; it is not supported on ISDN BRI sets.

Attendant Overflow Position

An ISDN BRI DN cannot be assigned as an attendant overflow position DN. Calls originated by ISDN BRI terminals can be automatically routed to a predefined DN, however, the terminal display will not be updated to show the call modification.

Attendant Recall

An ISDN BRI terminal communicating with a non-ISDN BRI terminal is recalled to the attendant as the source party if the recall is initiated by the non-ISDN BRI terminal. An ISDN BRI terminal cannot initiate an attendant recall.

Attendant Release

The attendant has no control over disconnection of an ISDN BRI terminal if the call is with another ISDN BRI terminal. The ISDN BRI terminal can release the call even if the attendant has not pressed the Release key.

Automatic Timed Reminders

A call made by an ISDN BRI terminal can be extended by the attendant to an ISDN BRI or non-ISDN BRI terminal and timed for slow answer or call waiting recall. When the timer expires, the call is recalled to the attendant.

Camp-on recall is not supported by the ISDN BRI DN.

Busy Tone to Night DN on Busy DN

This feature allows busy tone, rather than ringback tone, to be provided to a night DN during night service.

This feature is supported transparently if the calling station is an ISDN BRI terminal; however, an ISDN BRI terminal cannot be supported as a night DN terminal.

Automatic Call Distribution

An ISDN BRI terminal cannot be an ACD agent terminal, however, an ISDN BRI terminal can place a call to an ACD agent.

Call Forward All Calls

An ISDN BRI terminal does not support call forward all calls. Calls originating from an ISDN BRI terminal can be forwarded if call forwarding is activated by a non-ISDN BRI terminal. The calling ISDN BRI terminal display is not updated to show the call change. An ISDN BRI DN can also be defined as a call forward DN.

Call Forward/Hunt Override via FFC

Call Forward/Hunt Override provides all telephone users (having a specific class of service) and attendants with the ability to override Intercept Computer Call Forward (ICP-CFW), Call Forward All Calls, Call Forward No Answer, Hunting and Make Set Busy by entering a Flexible Feature Code. Sets without Call Forward/Hunt Override denied (CFHD) class of service will not be able to use the Call Forward/Hunt Override Via Flexible Feature Code (FFC) feature.

Call Forward/Hunt Override Via FFC works in network environments with Meridian 1 nodes and Meridian Customer Defined Network (MCDN) links.

This feature is supported over ISDN BRI trunks in an MCDN environment, if NAS is equipped. It is not supported on ISDN BRI sets.

Call Park

An ISDN BRI terminal cannot be parked nor can it park a call, however it can retrieve a parked call through a system park DN. An ISDN BRI DN can be used as a station park DN.

Call Party Name Display

Names are not displayed on ISDN BRI terminals, however, a name for an ISDN BRI DN can be defined using Calling Party Name Display Program LD 95 to allow a non-ISDN BRI terminal with display to identify the ISDN BRI terminal that originated the call. This name can be transmitted across ISDN PRI network.

Called Party Disconnect Control

A disconnect signal from an incoming trunk call to an ISDN BRI terminal is ignored by the terminal.

A call originating from an ISDN BRI terminal and to an outgoing trunk can be disconnected from either end.

Call Transfer

An ISDN BRI terminal can be transferred by a non-ISDN BRI terminal and a non-ISDN BRI terminal can transfer a call to an ISDN BRI terminal. In either case, the ISDN BRI terminal display is not updated to indicate call modification.

Calling Line Identification

Calling line identification is sent across ISDN PRI to and/or from ISDN BRI terminals. Trunk access code is displayed at the called ISDN BRI terminal instead of the calling line identification if it has calling party number restricted.

If a network call is redirected the calling line identification is not updated.

Charge Account/Calling Party Number

Charge account cannot be activated by an ISDN BRI terminal, however, a non-ISDN BRI terminal communicating with an ISDN BRI terminal can activate charge account and enter an ISDN BRI DN as the calling party number to be included in the call detail recording report.

China #1 signaling features

Part 2 features

This group of features is comprised of the following:

- External Operator features, comprised of:
  - Call Back
  - Calling Party Control (CGPC);
  - Called Party Control (CDPC);
  - Toll Operator Break-in (TOBI).
- Multiple Frequency Compelled (MFC) Direct Outward Dial (DOD) with outgoing Calling Number Identification (CNI);
- Outgoing Toll Call Identification

The External Operator Call Back feature is used by CGPC, CDPC, and TOBI. It allows a calling station connected to a trunk call to be put on hold while going on hook. When the special operator signal is received over the trunk the system will ring the station again. CGPC allows the call to be kept on hold for a defined period of time, and to reconnect the call when the called party goes off hook.

The call is released if the calling party goes on hook once more. CDPC allows an operator, involved in an operator-assisted call from a Meridian 1, to automatically recall a station without having to re-dial it. TOBI allows a toll operator to break in to an established call.

If an ISDN BRI terminal is the controlling party (that is, the called party in CDPC or the calling party in CGPC), the features are supported transparently, since disconnect messages from the trunk are ignored. If an ISDN BRI terminal is not the controlling party, when it goes on hook, this operation is not supported on ISDN BRI.

TOBI to an ISDN BRI terminal is not supported.

MFC DOD with outgoing CNI allows outgoing Calling Number Identification information on outgoing MFC trunk calls. CNI information is customer-related and terminal-related, both of which are supported for ISDN BRI. Terminal-related information is a category code defined in overlay 10 or 11. For ISDN BRI terminals, the category code is supported on a DSL basis. Overlay 27 has been modified to configure and print category codes, using the “category code” (CAC) prompt.

Outgoing Toll Call Identification allows outgoing toll calls to be identified in a new manner. This feature is supported transparently for ISDN BRI.

Addendum to Part 2 features

This group of features is comprised of the following:

- Operator call back feature enhancement;
- Special operator call back ringing;
- Malicious Call Trace enhancement;
- Tones and announcements;

- Active feature dial tone;
- Audible alarm.

The Operator call back enhancement allows Call Wait or Camp-On to Calling Party Control and Called Party Control calls, and Attendant Break-in to outgoing Calling Party Control calls and incoming Called Party Control calls. The Camp-on and Break-in capabilities are not supported on ISDN BRI, while the Call Wait capability is supported transparently for ISDN BRI.

The Special operator call back ringing enhancement provides operator control of ringing cadences used in Toll Operator Call Back. This capability is supported transparently for ISDN BRI.

The Malicious Call Trace enhancement allows a Meridian 1 to have Called Party Control on incoming calls when the Malicious Call Trace (MCT) feature is activated from a station, or when the Multifrequency Compelled (MFC) Idle Call Trace (IDCT) signal is sent. This enhancement is not provided on ISDN BRI.

The tones and announcement feature allows a howler tone to be given to indicate that a 500/2500 terminal is off-hook. This capability is not applicable to ISDN BRI terminals. This feature also provides new intercept treatments upon the reception of some MFC signals. This capability is supported transparently for ISDN BRI.

The active feature dial tone capability provides a distinctive dial tone to a station going off hook when it has the Do Not Disturb (DND) or Make Terminal Busy (MSB) feature active. This capability is not provided on ISDN BRI.

The audible alarm feature provides an alarm to be sounded when an emergency number has been dialed, or when the system is alerted of an incoming malicious call. This capability is supported transparently for ISDN BRI.

Part 4 - Ministry of Electricity and Industry (MOEI) features

This group of features is comprised of the following:

- KE Multifrequency Compelled Signaling;
- Flexible timers (dialtone, interdigit, and delayed answer);

- Calling party DN option;
- Flexible Feature Codes (FFCs).

KE Multifrequency Compelled Signaling is used to inform the Central Office that the call is a tandem call. This capability is supported transparently for ISDN BRI.

Flexible timers provides customer-defined parameters to control the following timeouts:

- the dialtone timeout, after the terminal has been placed off-hook and no digits dialed. After timeout, the terminal is placed in line lockout
- the interdigit pause timeout, between the first and second digits, and the interdigit pause timeout, after the second digit
- the delayed answer timer provides a customer-defined timeout to control the period that a terminal remains ringing before it is answered. If timeout occurs, the ringing and ringback stop, and the call is disconnected.

Flexible timers is not supported on ISDN BRI terminals.

Calling Party DN allows the Meridian 1 to send to the Toll Office the calling-party customer DN and, if applicable, the calling-party DID DN for all outgoing calls. This capability is supported when the calling party is an ISDN BRI terminal.

The Flexible Feature Code enhancement answers China's Ministry of Electronic Industry's requirement to access the following features from a 500/2500 telephone terminal, using Flexible Feature Codes:

- Autodial
- Call Waiting
- Make Terminal Busy
- Multiple Wake-up

This capability is not provided for ISDN BRI.

Enhanced Flexible Hotline

Hotline is not available on an ISDN BRI terminal, however, an ISDN BRI DN can be defined as a hotline number.

Forced Camp-on

Forced Camp-on allows a call to be camped on to a busy station while providing a warning tone. This is typically followed by the activation of Priority Override, which allows break-in to the established connection.

Forced Camp-on is activated automatically (if Automatic Forced Camp-on is defined); or, it can be activated manually using the Enhanced Override (EOVR) key on M1000 series and Meridian digital terminals or the Enhanced Override Flexible Feature Code on 500/2500 terminals. If the EOVR key is pressed again or the Enhanced Override Flexible Feature Code dialed again, Priority Override is activated.

The terminal performing the override must have a priority level equal to or higher than the terminal being overridden. To activate Priority Override, the user of a 500/2500 terminal dials the Override Flexible Feature Code, while the user of a M1000 series or Meridian digital terminal presses the Override key (OVR). Priority Override can also be activated using the Enhanced Override Flexible Feature Code or the Enhanced Override key (EOVR).

Forced Camp-on is partially supported on ISDN BRI terminals, as explained below:

- Forced Camp-on to an ISDN BRI terminal is not possible, because Forced Camp-on requires Warning Tone Allowed Class of Service (ISDN BRI terminals are defaulted to WTD COS);
- Forced Camp on from an ISDN BRI terminal is not possible because feature keys and FFC are not supported for ISDN BRI;
- a BRI terminal transferred to a non-BRI terminal may be have forced camp-on applied to it, if no COS restrictions apply; however, the ISDN BRI terminal display is not updated.

Group Hunt

Group Hunt is partially supported on ISDN BRI terminals, as explained below:

- an ISDN BRI terminal cannot be a member of a group hunt list, due to lack of support of FFC (Group Hunt Deactivation is not possible);
- an ISDN BRI terminal cannot access a group hunt list, since FFCs are not supported;
- a call from an ISDN BRI terminal to another ISDN BRI terminal may be hunted, or call forwarded no answer, to a Group Hunt Pilot DN FFC.

Incoming DID Digit Conversion

An ISDN BRI DN can be defined as the converted DN, however, the dialed number identification service number will not be displayed on an ISDN BRI terminal.

Intercept Computer Interface

This feature allows the Meridian 1 to use an intercept (attendant assistance service) computer for storing and retrieving call messages. Calls to an absent tenant's DN using this feature are routed to a designated Intercept Position (ICP) DN. A terminal at the ICP displays a message stating why the tenant at the DN is absent. The person at the ICP can then store the caller's message for the tenant's DN and activate the message waiting LED at the tenant's telephone. The tenant at the DN retrieves the stored caller messages by calling the ICP, where the messages are displayed on the terminal (or optionally printed).

The feature can be activated or deactivated by the following:

- Flexible Feature Code (FFC) dialed from the tenant's telephone. This code specifies the reason for the tenant's absence and can be extended with a date and time as extra information. The FFC decodes into a text message;
- Pressing the Call Forward All Calls (CFW AC) key on an SL-1 telephone (deactivation);
- From the ICP terminal;
- Automatically when a TN is disabled or enabled by a maintenance overlay program.

The Intercept Computer Interface is partially supported on ISDN BRI terminals, as explained below:

- an ISDN BRI terminal cannot access the ICP feature, since FFCs are not supported for ISDN BRI; also, the ICP feature cannot be activated on an ISDN BRI terminal from the intercept computer or via a maintenance overlay program, since the ICP feature is activated on a terminal basis;
- an ISDN BRI terminal cannot act as an intercept position, or be allowed to be a default DN for intercept transfer; only Message Center ACD DNs and attendant DNs are allowed to be intercept positions;
- a call originating from an ISDN BRI terminal and terminating on a non-ISDN BRI terminal with ICP active is intercepted according to the ICP configuration; the ISDN BRI terminal display cannot be updated after the call redirection.

Intercept Computer enhancements

Call Forward interaction control

When an intercept transfer is activated from a customer's or tenant's extension, it may be configured that only external calls be forwarded to the external intercept DN (ECDN), while internal calls are forwarded to an answering machine, or the internal intercept DN (ICDN). Note that this capability applies only if the extension's flexible call forward no answer DN (FDN) is not configured as an intercept position.

This feature is partially supported on ISDN BRI terminals, as explained below:

- since an ISDN BRI terminal cannot access the ICP feature, it cannot support this ICP enhancement;
- a call originating from an ISDN BRI terminal that is considered as an internal calling party, and terminating on a non-ISDN BRI having the ICP feature active, is diverted to the intercept DN for internal calls.

IMS/IVMS

Calls originated from an ISDN BRI terminal may be redirected to IMS/IVMS and leave a text or voice message for the called party.

For voice messages, an ISDN BRI terminal that can generate end-to-end signaling can access other options available.

Calls terminated on an ISDN BRI terminal may be redirected to IMS/IVMS through call forward no answer or hunting, but the ISDN BRI DN will not have a mailbox defined and a caller may not leave a message for an ISDN BRI DN.

ISDN BRI Network Ring Again

The Network Ring Again feature cannot be activated from nor offered to an ISDN BRI terminal due to a lack of standardized functional protocol for supporting the feature. For non-ISDN terminals encountering a busy ISDN BRI terminal, the Network Ring Again feature is not offered to the non-ISDN terminals for the same reason.

ISDN QSIG Name Display

Calling Party Privacy (CPP) Flexible Feature Code is not supported on BRI sets. Therefore, Calling/Connected Name Identification Restriction on a per-call basis is not supported on BRI sets.

Malicious Call Trace

An ISDN BRI terminal cannot activate malicious call trace. A non-ISDN BRI terminal can activate malicious call trace on a call connected to an ISDN BRI terminal.

Meridian Mail Trunk Access Restriction

This feature does not support Call transfer from ISDN BRI sets.

Message Center

A call originating by an ISDN BRI terminal to a non-ISDN BRI terminal may be redirected to Network Message Service - Message Center. The associated MIK/MCK and the lamp states are not supported for the corresponding ISDN BRI terminal.

Multifrequency Compelled Signaling features

R2 and MFC signaling on DID and TIE trunks

This feature allows line and register signaling on DID and TIE trunks, using an MF sender and receiver card. Each forward signal sent to the Central Office is acknowledged by a backward signal. This feature also allows the Meridian 1 to request Calling Number Identification (CNI) information, to be shown on the originating terminal's display.

The register signaling part of this feature is supported for ISDN BRI. The CNI display is not supported.

Multifrequency Signaling for Socotel (MFE)

Multifrequency Signaling for Socotel (MFE) is similar to R2 Multifrequency Compelled (MFC) Signaling, but is not compelled in the same way. Instead of each signal being answered by another signal of some meaning, each signal is answered by a control frequency which indicates to the other end of the call that the signal has been received and its transmission can cease. In this way, signals may originate at either end of the call.

R2 MFC Signaling operates by answering each forward signal from the originating end, with a backward signal from the terminating end. Each signal must be interpreted using the appropriate table. Unlike R2 MFC Signaling, backward and forward signals use the same frequency combinations. The need for the concept of an incoming or outgoing sender/receiver is replaced by an MFE sender/receiver, which can act in both directions during any single call.

Pulsed signals, which are used in R2 MFC Signaling to indicate a message being initiated from the CO which normally replies, are no longer necessary with the new MFE card.

The sequence of messages sent to and received from the CO is transparent to the ISDN BRI terminal.

Multiple Appearance Directory Number

Multiple ISDN BRI terminals on the same DSL can have the same DN. An ISDN BRI and a non-ISDN BRI terminal cannot have the same DN.

ISDN BRI multiple appearance DN is not allowed across different DSLs and is also not allowed for non-ISDN BRI terminals.

Multi-Party Operations

Call Join

The Call Join feature allows a controlling party to conference-in or transfer an active party to a held party. The controlling party can then hang up. The controlling party's terminal must be equipped with a Conference 3/6 key, and at least one secondary DN or Call Waiting key.

ISDN BRI terminals cannot be the controlling party. If the ISDN BRI terminal is the active party or held party, the Call Join feature is supported as described; however, the ISDN BRI terminal display is not updated.

Networking features

International ISDN PRI interworking

The interworking between ISDN BRI and International ISDN PRI Central Office Connectivity allows voice calls to always be completed to and from ISDN BRI terminals; however, some restrictions may apply to data calls.

Advice of Charge for NUMERIS connectivity

This feature provides the total cost for a call made from a Meridian 1 switch to the ISDN access designed for France (NUMERIS). The Meridian 1 to NUMERIS PSTN connectivity is implemented using ISDN packages PRI2 and IPRI.

This feature is supported for ISDN BRI terminals as the Periodic Pulse Metering feature is supported.

Advice of Charge for AXE-10 Australia and Japan D70 connectivity

The Advice of Charge (AOC) at End of Call for AXE-10 Australia and Japan D70 feature supports charge information being sent from an AXE-10 (Australian) or D70 (Japanese) Central Office to the PBX, over an ISDN BRI connection. The information is sent for outgoing calls from the PBX.

Information is received and displayed when the call is taken down. It is displayed on the caller's telephone display as supported by the Charge Display at End of Call feature. This feature appends the charge information to existing information on the display and retains the information displayed for 10 seconds. Charge Display applies to display-equipped Meridian Modular terminals, M2317, and M3000 sets only. The information is also printed as part of the Call Detail Recording (CDR) record.

Australia introduces PBX control of the AOC facility, meaning that the information must be requested for each outgoing call as opposed to expecting it for every call once the feature has been configured. Japan does not support PBX control of the AOC facility.

Message Registration (MR) and Periodic Pulse Metering (PPM) are both packaged under software package 101. Prior to the introduction of this feature, the method used to differentiate which feature was equipped was to check if the International Supplementary Features software package was equipped. If it was, PPM was required. Since the Supplementary Features package is not available in Japan and AOC requires PPM software, a new method of differentiation has been introduced. This method uses a system wide flag to allow the customer to select between MR and PPM. This flag is set by a prompt in LD 17

The AOC feature does not support AOC being sent to ISDN BRI terminals. A meter can be assigned to a DSL. All chargeable calls made by an ISDN BRI terminal on this DSL are charged against the DSL's meter.

Advice of Charge EuroISDN connectivity

This feature provides Integrated Services Digital Network (ISDN) Primary and Basic Rate Interfaces to Central Offices/Public Exchanges that comply to the European Telecom Standards Institute (ETSI) specification ETS 300 102 for the Layer 3. The interfaces provided by this feature also comply with the country-specific Application Documents for Austria, Denmark, Finland, Germany, Holland, Ireland, Italy, Norway, Portugal, Sweden, and Switzerland. Other countries must comply with ETS 300 102 to be supported.

The supplementary services Calling Line Identification Presentation, Calling Line Identification Restriction, Connected Line Identification Presentation and Connected Line Identification Restriction are provided for the above countries where Application Documents are available. In addition, Advice of Charge for EuroISDN is supported in some of these countries. For more information about Advice of Charge for EuroISDN, see the feature description contained in this document.

The EuroISDN feature also provides interworking with other ISDN or non-ISDN interfaces including Meridian Customer Defined Network (MCDN), QSIG, Digital Private Network Signaling System 1 (DPNSS1), R2 Multifrequency Compelled Signaling (R2 MFC), 2 Mb Digital Trunk Interface (DTI2), and analog trunk interfaces. This feature also provides interworking between NET3 S0 (ETSI compliant BRI sets) and DPNSS2/DASS2 (Digital Access Signaling System 2) links.

Meridian 1 to New Zealand NEAX-61 ISDN PRI Connectivity

This feature provides an ISDN Primary Rate Interface (PRI) between a Meridian 1 (SL-1) and New Zealand NEAX-61. The design in based on the international 30B + D PRI configuration.

The NEAX-61 interface will support calls from ISDN BRI sets within the MCDN. These will be able to call out to and receive calls from the Public Switched Telephone Network (PSTN), also called the ISDN public network. Operation will be as though the call was a tandem trunk call.

Although ISDN BRI trunks to the NEAX-61 are not supported, any ISDN BRI trunks supported to other interfaces will be able to tandem to the PSTN transparently. Feature operation will appear to the user as though the call was from a normal PRI network trunk to the PSTN.

Night Service improvements

All calls remain queued for night service

This feature allows all calls that are queued for an attendant when night service is entered, to remain queued in order to be presented to the night DN. This feature is supported for ISDN BRI-originated calls; however, the displays on the ISDN BRI terminals are not updated to reflect the call modification.

Automatic timed reminder recalls to the night DN

This feature allows any recall that times out during night service, to be presented or queued to the night DN. This applies to slow answer recall, call waiting and camp-on calls extended by an attendant, and camp-on calls extended by a terminal.

This capability applies to external call only, since there is no internal recall to a night DN unless done by NAS routing.

This feature is partially supported for ISDN BRI. If an external call has been extended an attendant to an ISDN BRI terminal, and the slow answer recall timer or the call waiting recall timer expires before the call is answered, the call is presented or queued to a local or remote night DN. The ISDN BRI terminal is disconnected in the case of the slow answer recall, and the call waiting canceled in the case of the call waiting. The camp-on recall timer does not apply, because Camp-on is not supported for ISDN BRI.

If a call originating from an ISDN BRI terminal has been extended or camped on by the attendant to a non-ISDN BRI terminal, the call is timed for slow answer recall, call waiting recall, or camp-on recall. If the timer expires, the call is dropped if not controlled by NAS routing. The call is also dropped if it is controlled by NAS routing and the night DN is at a remote node. If the call is controlled by NAS routing and the night DN is at the local node, the call is presented or queued to the night DN. When the recall timer expires, the terminating party is disconnected, or the call waiting or camp-on is canceled.

A non-ISDN BRI terminal cannot extend a camp-on to an ISDN BRI terminal, since Camp-on is not supported for ISDN BRI.

Periodic Pulse Metering

This feature, based on the Message Registration feature, allows meters to be assigned to terminals, attendant consoles, trunk routes, and customers. This permits Meridian 1 customers to maintain accurate records of Central Office and DOD calls, for billing or administrative purposes. The Call Detail Recording (CDR) feature has been enhanced to record the PPM metering information.

This feature has been adapted for ISDN BRI application as follows. Since meters cannot be assigned to ISDN BRI terminals, because there is no standard protocol to update an ISDN BRI terminal's meter, meters have been assigned to Digital Subscriber Loops (DSLs) instead. All charges due to ISDN BRI terminals located on the same DSL are accumulated on the assigned meter. The contents of this meter may be read or changed from any authorized non-ISDN BRI station.

The metering of conventional trunks is supported transparently. The metering of ISDN BRI trunks is not supported.

Meter recalls to the attendant and background terminal messaging uses the originating ISDN BRI CLID.

Meter charge transfers associated with the activation of Hunt or Call Forward No Answer from an ISDN BRI terminal are not supported; the calling party is charged for the entire call.

Radio Paging

This feature allows call paging through the use of a Flexible Feature Code. The paged party, who is notified of a call page by the buzzing of a special device, can later access the paging party by dialing another FFC. There are three methods of paging a call:

- pre-selection, whereby the paging is performed right away;
- post-selection, whereby a FFC is used in cases where the desired party is busy or does not answer;
- forwarding to a paging equipment.

Paging cannot be done from an ISDN BRI terminal, since FFCs are not supported for ISDN BRI. Paging to an ISDN BRI terminal is supported for the pre-selection and post-selection methods; it is not supported for the forwarding method.

Radio Paging Product Improvements

Attendant Recall over Network

This product improvement enables Radio Paging (RPA) to recall the attendant who originated the Radio Paging call only; the attendant may be located anywhere within an ISDN Meridian Customer Defined Network (MCDN) configured with Network Attendant Services (NAS).

Digit Display to Same Attendant

This improvement enables the attendant's display to be updated with paged name to display paged name instead of answering name on the paging party when answered, and to make network Radio Paging show the same display information as in the standalone operation.

Since ISDN BRI sets do not support FFCs, they cannot be used to access or answer RPA calls if the ISDN BRI sets are local on the paging node. For network situations, ISDN BRI sets can access and answer remote RPA calls. This is possible because the RPAX/RPAN FFCs are dialed as DSC/TSC steering codes.

Attendant Recall over Network is supported over ISDN BRI trunks within an ISDN Meridian Customer Defined Network (MCDN) configured with Network Attendant Services (NAS).

Recorded Announcement for Calls Diverted to External Trunks

Recorded Announcement for Calls Diverted to External Trunks (RANX) provides an optional recorded announcement when the call is being forwarded to external Public Exchange/Central Office (over DTI, DTI2, PRI2, PRI, or analog trunks) or over ISDN BRI trunks connected to AXE-10 or EuroISDN routes. The announcement notifies the calling party that call forwarding is taking place and the call may take longer than usual to set up. The delay depends on the required signaling to reach the destination party.

This feature allows special dial tones to be provided after certain dialed digits.

This feature is generally supported for digits dialed from ISDN BRI terminals. For each TERMINALUP and INFO message, the software determines if tones are required; however, if enblock dialing is used, it cannot be confirmed whether or not some of the messages contain only one digit, or several digits. If they contain several digits, some tones may be skipped.

Station Activity Record

Station activity records are generated for sets with class of service Call Detail Monitoring Allowed (CDMA) for all incoming and outgoing calls if Call Detail Recording (CDR) is allowed for the customer. Their format is identical to regular CDR records, but they have a new type identifier (D). Other CDR records are not affected by this new functionality.

Station activity records are supported on ISDN BRI sets with a class of service Call Detail Monitoring Allowed (CDMA), for external calls.

Three-Party Service

The Three Party Service feature allows a user of a 500/2500 terminal with Three Party Service Allowed (TSA) COS to toggle between an active party and a held party on an ISDN BRI terminal, through the use of the Call Hold feature. However, a three party conference cannot be formed.

AN ISDN BRI terminal may be placed on hold or placed in a three party conference by a controlling terminal that is a non-ISDN BRI terminal; however, the ISDN BRI terminal display is not updated.

Conference 6

The Conference 6 feature is an extension of Three-party service, allowing users of 500/2500 telephones, with TSA and C6A COS, the added capability of establishing a conference of up to six parties.

AN ISDN BRI terminal may be placed in a six party conference by a controlling terminal that is a non-ISDN BRI terminal; however, the ISDN BRI terminal display is not updated.

Recovery of Misoperation on Call Transfer

The Recovery of Misoperation of Call Transfer feature prevents external calls from being dropped due to misoperation of the Call Transfer feature. Optional treatments of a misoperation may be configured on a customer basis.

Recovery of Misoperation of Call Transfer is not available on ISDN BRI terminals. If the controlling station misoperates on a transfer of a call originating from an ISDN BRI terminal, the call receives the configured misoperation treatment; however, the ISDN BRI terminal display is not updated.

Network Signaling for Network ACD

ISDN BRI terminals cannot be configured as network ACD DNs, however, ISDN BRI terminals can make calls to the network ACD DNs.

Network Call Redirection Service

ISDN PRI redirection for ISDN BRI terminals is limited as follows:

- ISDN BRI terminals may be redirected across the PRI network, however, the terminal will not be notified about the redirection.
- ISDN BRI terminals may redirect a PRI call using hunting and call forward no answer. It may also redirect a call across PRI the same way.

Network Attendant Service

Network Attendant Service (NAS) provides the capability of stand alone attendant service, full or part time, across a Meridian 1 network.

NAS provides the following attendant features network wide:

- attendant routing, which allows calls to an attendant to be routed to any other destination within the network;

- night service;
- call extension, which allows calls to an attendant to be extended across a network;
- timed reminder recall, which allows unanswered calls to be recalled to the attendant. When the attendant extends a call to a destination at another node, the trunks are not released. This prevents call disconnection and gives the attendant control of the call, including the ability to exclude the source or destination;
- incoming call indication, which is received when a call reaches the attendant via NAS routing;
- Camp-on and Call Waiting;
- Break-in;
- attendant control, which gives the attendant control of the call, including control of disconnecting the call and the ability to exclude the source or destination;
- ring held party, which allows the attendant console to receive ringing if a terminal that originated a call to the attendant disconnects while attendant control is configured;
- attendant display of Calling Line Identification (CLID), which allows the CLID of the calling party to be displayed on the attendant console.

These features are supported transparently for ISDN BRI, with the following exceptions:

- Camp-on;
- Break-in;
- network wide attendant control; when an ISDN BRI terminal disconnects from an attendant extended call, the call is released on the ISDN BRI side;
- ring held party; when an ISDN BRI terminal disconnects from an attendant extended call, the call is released on the ISDN BRI side.

The displays on ISDN BRI terminals are never updated.

Network Call Transfer

An ISDN BRI terminal cannot transfer a call, but a call originating from an ISDN BRI terminal can be transferred to an ISDN BRI or a non-ISDN BRI terminal. The display on the ISDN BRI terminal will not be updated.

Night Service/TAFAS

A call originated by an ISDN BRI terminal to an attendant console in night service will be routed through a customer night DN. The display on the ISDN BRI terminal will not be updated to show call redirection.

Priority Override

Priority Override is partially supported on ISDN BRI terminals, as explained below:

- Priority Override to an ISDN BRI terminal is not possible, because Priority Override require Warning Tone Allowed Class of Service (ISDN BRI terminals are defaulted to WTD COS);
- Priority Override from an ISDN BRI terminal is not possible because feature keys and FFC are not supported for ISDN BRI;

Recall to Same Attendant

This feature is supported transparently; however, the displays on ISDN BRI terminals are not updated.

Switched 56 kbps Service

An ISDN BRI terminal can use switched 56 kbps service if a data route has been previously established or the ISDN BRI terminal can generate a 2100 Hz tone to the network. This 2100 Hz tone disables echo cancellation that is provided by the equal access carriers.

ISDN PRI features interaction with ISDN BRI

All Meridian 1 networking features and services supported by ISDN PRI are also supported by ISDN BRI. The following exceptions apply:

ISDN PRI features not supported

The following ISDN PRI specific features are **not** supported by ISDN BRI:

- 1.5/2.0 Mb gateway
- 2 Mb gateway

- Automatic Trunk Maintenance
- Backup D-channel
- Channel negotiation - The channel negotiation capability applies at the DSL level. If channel negotiation fails on a route with several ISDN BRI trunks (several DSLs) there is no second call attempt on another DSL in the same route.
- Digital Private Network Signaling No. 1 (DPNSS 1) - ISDN BRI supports a gateway between IDA (DPNSS1 version of PRI) and MCDN protocols for basic call features. Ring again features are not supported.
- In Service Messaging
- Integrated Service Access (ISA)
- ISDN Primary Rate Access Meridian 1 to AXE-10 Sweden Connectivity
- ISDN Primary Rate Access Meridian 1 to AXE-10 Australia Connectivity
- ISDN Primary Rate Access Meridian 1 to SYS-12 Connectivity
- Integrated Service Digital Network Signaling Link (ISL)
- Non-Associated Signaling Channels (nB+D)
- Trunk Anti-tromboning - supported only over Virtual Network Services BRI trunks
- Trunk Optimization (SL-1 to SL-1 only)
- Virtual Network Services - VNS takes advantage of ISDN signaling through a private D-channel using the Public Exchange voice connections instead of TIE trunk connections. It is not possible to configure a D-channel of an ISDN BRI Trunk Access as a VNS D-channel. However, the voice connection through the Public Exchange of a VNS call may use an ISDN BRI Local Exchange trunk. Also, Trunk Anti-Tromboning is supported on VNS BRI trunks.

Other ISDN PRI features:

- The restrictions and limitations applicable to the remaining ISDN PRI features are similarly applicable to ISDN BRI trunks.

Engineering and configuration guidelines

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Reference list

The following are the references in this section:

- *Software Conversion Procedures* (553-2001-320)
- *ISDN PRI: Installation* (553-2901-201)
- *Networking Features and Services* (553-2901-301)
- *Option 11C 1.5Mb DTI/PRI* (553-3011-310)
- *Option 11C 2.0Mb DTI/PRI* (553-3011-315)

Feature description

This section contains the ISDN guidelines for compatible Meridian 1 software and hardware configurations. This includes

- system compatibility information
- configuration parameters
- transmission characteristics
- software package requirements
- hardware requirements
- disk-drive upgrade requirements
- cable information
- data characteristics
- loss and level plan information

For detailed instructions on hardware installation, use the *ISDN PRI: Installation* (553-2901-201) document. For detailed information on connectivity requirements and data administration, use the *Networking Features and Services* (553-2901-301) document.

For Option 11C specific information, refer to *Option 11C 1.5Mb DTI/PRI* (553-3011-310) and *Option 11C 2.0Mb DTI/PRI* (553-3011-315).

System compatibility

The ISDN software supports the following system options:

- Option 11C
- Option 51C
- Option 61C
- Option 81C

Options 51C, 61C, 81C require the QPC583 board. Option 11C requires the NTAK01AA CPU conference card.

Intersystem compatibility

PRI Transmission characteristics

There are five characteristics of transmission necessary for ISDN PRI compatibility. These are

- carrier-system compatibility
- synchronization
- signaling
- trunk-type support
- voice and data transmission compatibility

Carrier system compatibility

Meridian 1 PRI is compatible with carrier systems which:

- use CEPT G.703 framing on repeater cables;
- use the CEPT G.703 interface (such as fiber optic, microwave, copper, satellite, and infrared transport);
- meet CCITT Q.921 and Q.931 recommendations; and
- use HDB3 line coding at 75-ohm coaxial or 120-ohm twisted-pair interfaces.

Synchronization

Stratum 3 compatible (accuracy, jitter, pull-in range)

Signaling

ISDN D-channel signaling is used for Primary Rate Access.

Trunk type support

- Tie (2-wire E&M, 4-wire E&M)
- Foreign Exchange (FX)
- WATS
- PBX-to-Public Exchange trunks; also known as Central Office (CO) trunks
- Direct Inward Dial (DID or DDI) trunks

Voice connections

Voice transmission meets the CCITT standard for flexible loss-and-level plan.

Data connections

Transmission modes:

- asynchronous 50 bps to 19.2 Kb/s
- synchronous 1200 bps to 64 Kb/s
- half or full duplex

Primary Rate Interface (PRI) hardware requirements

The following hardware is required to equip ISDN PRI on Meridian 1 system Options 51C, 61C, and 81C:

- NT6D11(AB/AE/AF) D-Channel Interface (DCH) card (for 2.0 Mb PRI)
- QPC757 D-channel Interface (DCH) for (1.5 Mb PRI)
- NT6D80 Multipurpose Serial Data Link (MSDL) card
- NTBK51 Downloadable D-Channel Daughterboard (DDCH), used as an option to the NT6D80 MSDL with the NTCK43 dual-port PRI2 card, the NT5D97 dual-port DTI2/PRI2 card, or the NT5D12 dual-port 1.5 Mb DTI/PRI card
- NT8D72 (AB/BA) PRI2 card

- NTCK43 dual-port PRI2 card
- NT5D97 dual-port DTI2/PRI2 card
- QPC720 1.5 Mb PRI card
- NT5D12 dual-port 1.5 DTI/PRI card
- QPC471 or QPC775 Clock Controller

  Note: The QPC775 Clock Controller is currently not available for U.S. markets. The QPC471 and QPC775 Clock Controllers cannot be mixed in one system. Vintages A through G of the QPC471 Clock Controller can be used in one system; vintage H of QPC471 Clock Controllers cannot be mixed with Clock Controllers of other vintages.

Additional hardware is also required for PRI capability and applications. Installation instructions are given in other Nortel Networks publications, or supplied by the manufacturer. This additional hardware includes:

- QPC414 Network card
- Channel Service Unit (CSU)
- Echo canceller
- ROM circuit card requirements:
  - — the QPC939A for Option 1C
  - — the QPC939A for option 61C

  Note: Option 81C ROM requirements are fulfilled by the NT6D66 Call Processor (CP) card.

- QMT8 Asynchronous Data Module (ADM)

ISDN Signaling Link (ISL) hardware

The following hardware is required for ISDN Signaling Link (ISL) capability and applications.

Equipment required for shared mode capability:

- NT6D11(AB/AE/AF) D-Channel (DCH) card (for 2.0 Mb PRI)
- QPC757 D-channel (DCH) for (1.5 Mb PRI)

- NT6D80 Multipurpose Serial Data Link (MSDL) card
- NTBK51 Downloadable D-Channel Daughterboard (DDCH), used as an option to the NT6D80 MSDL with the NTCK43 dual-port PRI2 card, the NT5D97 dual-port DTI2/PRI2 card, or the NT5D12 dual-port 1.5 Mb DTI/PRI card
- NT8D72 (AB/BA) PRI2 card
- NTCK43 dual-port PRI2 card
- NT5D97 dual-port DTI2/PRI2 card
- QPC720 1.5 Mb PRI card
- NT5D12 dual-port 1.5 DTI/PRI card
- QPC471 or QPC775 Clock Controller

Equipment required for dedicated mode using leased lines:

- NT6D11(AB/AE/AF) D-Channel (DCH) card (for 2.0 Mb PRI)
- QPC757 D-channel (DCH) for (1.5 Mb PRI)
- NT6D80 Multipurpose Serial Data Link (MSDL) card
- NTBK51 Downloadable D-Channel Daughterboard (DDCH), used as an option to the NT6D80 MSDL
- modem set in synchronous mode

Equipment required for dedicated mode using a dial-up modem:

- NT6D11(AB/AE/AF) D-Channel (DCH) card (for 2.0 Mb PRI)
- QPC757 D-channel (DCH) for (1.5 Mb PRI)
- NT6D80 Multipurpose Serial Data Link (MSDL) card
- NTBK51 Downloadable D-Channel Daughterboard (DDCH), used as an option to the NT6D80 MSDL
- modem with auto-dial capability

Note: This configuration is the least reliable due to lockup problems inherent in Smart Modems from power spikes and noisy lines. To increase the reliability on this configuration, use a constant power source when powering the modems. Also, verify that TIE lines meet data grade specifications. Northern Telecom takes no responsibility for ISL D-Channel outages due to modem lockup.

- 500 set line card
- QPC71 2W Tie, or QPC237 4W Tie E&M

Equipment required for dedicated mode using a DTI/DTI2 trunk:

- NT6D11(AB/AE/AF) D-Channel (DCH) card (for 2.0 Mb PRI)
- QPC757 D-channel (DCH) for (1.5 Mb PRI)
- NT6D80 Multipurpose Serial Data Link (MSDL) card
- NTBK51 Downloadable D-Channel Daughterboard (DDCH), used as an option to the NT6D80 MSDL
- QPC536 DTI2 card, or NTCK43 dual-port PRI2 card or NT5D97 dual-port DTI2/PRI2 card
- QPC472 1.5 Mb DTI card or NT5D12 dual-port 1.5 DTI/PRI card
- QMT8 Asynchronous Data Module (ADM), QMT11 Asynchronous/Synchronous Interface Module (ASIM) or QMT21 High Speed Data Module (HSDM)
- Data line card

Disk drive hardware

The following hardware is required for Meridian 1 options 51C, 61C, and 81C system upgrades:

- 3.5-inch disk drive unit
- disk drive controller for above
- cable for above

Group F software (or any later issue) on an ST does not require a 3.5-inch disk drive. On this machine option, Group F software will function with the 5.25-inch disk drive.

See Table 123 for information on disk drive components.

Table 123
3.5 inch disk hardware requirements

Product Code	Description
NT8D68AA	Floppy Disk Unit (FDU)
NTUD69AA	Mass Disk Unit (MDU)
QPC742D	Floppy Disk Interface (FDI) for FDU
QPC584E	Floppy Disk Interface (FDI) for MDU
NT8D77AB	Mass Storage Unit (MSU) interface cable (2 ft, 0.6m)
NT8D77AA	Mass Storage Unit (MSU) interface cable (3 ft, 0.9m)
NT8D77AC	Mass Storage Unit (MSU) interface cable (4 ft, 1.2m)
NT8D77AD	Mass Storage Unit (MSU) interface cable (5 ft, 1.5m)

Cable and channel information

The following sections contain cable and channel information.

Cable distance

The cable type used is a 2-pair twisted wire. Maximum cable distances are:

- 200 m (655 ft) from the Meridian 1 to cross-connect point (using ARAM or ABAM equivalent cable)
- 229 m (750 ft) from the Meridian 1 to Office Repeater Bay

Configuration parameters

There are two types of configuration parameters:

- line rate
- T1 and E1 compatibility

The line rate is 1.544 Mb for T1 and 2.048 Mb for E1.

The integrated voice and data can use a single medium to transmit speech and data between locations.

There are three advantages to T1 or E1 compatibility:

- E-link or T-link version 2 supports Meridian 1 to Meridian 1, Meridian 1 to SL-100, and Meridian 1 to Custom DMS-100 for 56 or 64 kbps data, ad Meridian 1 to Central Office connectivity.
- includes capability to be configured as a standard T1 DS-1 link
- eliminates need for channel bank equipment when using digital network facilities

Data characteristics

PRI utilizes Nortel Network's T-link Data Rate Adaptation protocol. There are three transmission modes:

- asynchronous 50 bps to 19.2 kbps
- synchronous 1200 bps to 64 kbps
- half or full duplex

Transmission characteristics

There are five types of transmission necessary for ISDN compatibility:

- carrier system compatibility
- synchronization
- signaling
- trunk types supported
- voice transmission

These transmission types are described in the lists that follow.

Carrier system compatibility:

- compatible with D2, D3, D4, B8ZS, and Extended superframe format (ESF) framing on T1 repeater cables
- compatible with systems that use a DS-1 interface, such as fiber optics, microwave, copper, satellite, and infrared

- meets CCITT Q.921 and Q.931 recommendations
- complies with T1D1 minimal subset

Synchronization: stratum 3 compatible (accuracy, jitter, pull-in range)

Signaling:

- in PRI mode: ISDN D-channel signaling
- in DTI mode: loop start, ground start, E&M, DTMF, and dial pulse
- in ITA mode: PRI trunks use PRI mode and DTI trunks use DTI mode

Trunk types supported:

- CO, FX, WATS, DID, TIE (2-wire E&M, 4-wire E&M)

Voice transmission:

- meets EIA Digital PBX Draft Standard PN-1429 requirements such as loss and level, distortion, and delay

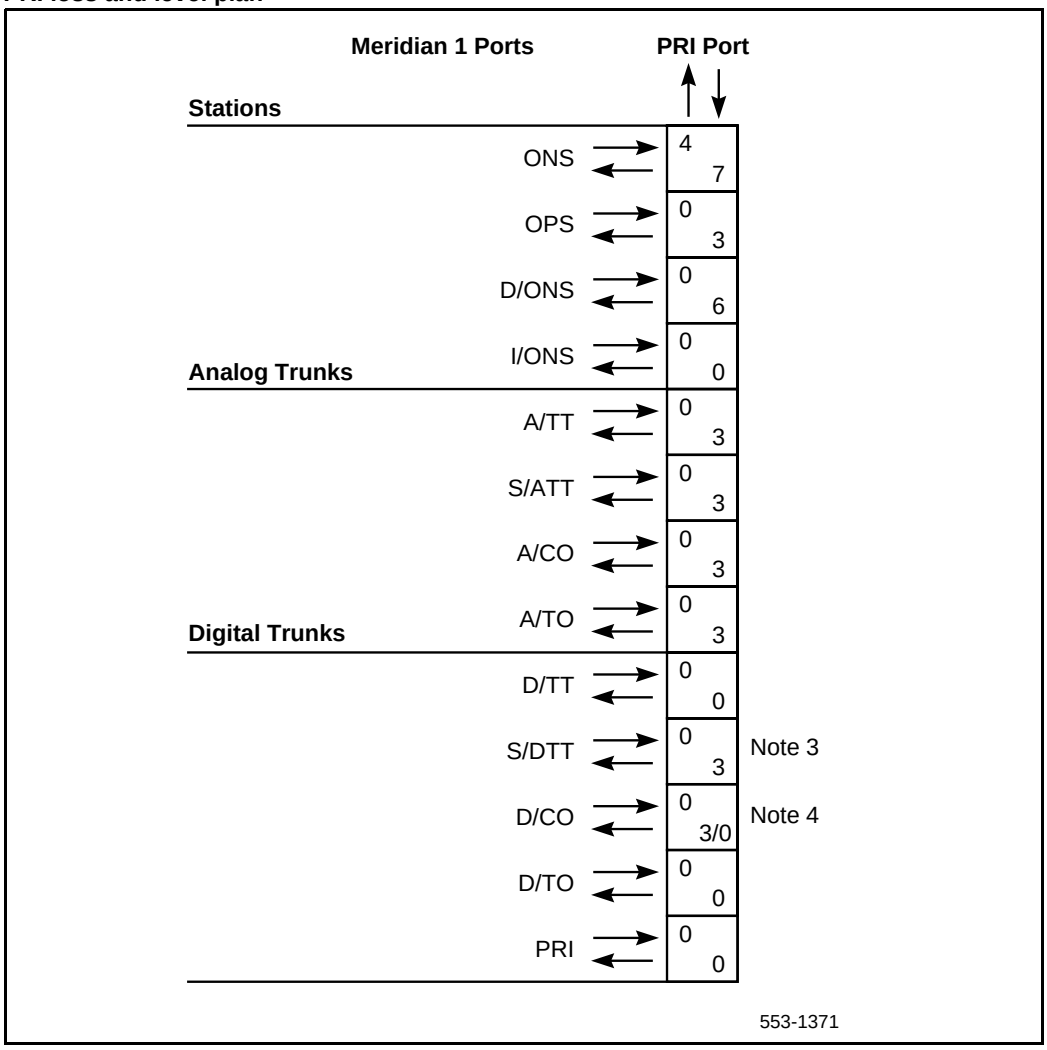
  Note: ISDN meets the Radio Frequency Interference (RFI) requirements.

Loss and level plan

The loss plan for PRI has been added to the existing Meridian 1 loss matrix (the EIA loss plan).

Figure 184 shows the connections on a port-to-port basis and the corresponding loss values (in dB) for both directions of transmission.

Figure 184
PRI loss and level plan



Note 1: The loss is bidirectional. For example, the A/TT coordinate indicates a nominal port-to-port loss of:
0 dB from the A/TT interface to the Primary Rate Interface (PRI)
3 dB loss from the Primary Rate Interface (PRI) to the A/TT interface

Note 2: The table column is shown; the loss table has a corresponding row.

Note 3: For echo control reasons, this connection cannot be loss-less.

Note 4: The value of 0 dB in the PRI-D/CO direction is the long-term objective. The value of 3 dB is to be used for connections to D/COs that have not been programmed for inserting receive-side loss on PRI to local loop connections.

Legend:

ONS	Line interface/on premise line
OPS	Line interface/off premise line
D/ONS	Digital line interface/on premise line
I/ONS	ISDN terminal (on premise)
A/TT	Analog trunk interface/analog TIE trunk
S/ATT	Analog trunk interface/analog satellite PBX TIE trunk
A/CO	Analog trunk interface/analog CO trunk
A/TO	Analog trunk interface/analog toll office trunk
D/TT	Digital trunk interface/digital or combination TIE trunk
S/DTT	Digital trunk interface/digital satellite PBX TIE trunk
D/CO	Digital trunk interface/digital or combination CO trunk
D/TO	Digital trunk interface/digital or combination toll office trunk
PRI	Primary Rate Interface

Call connection limitations

Call connection restrictions limit user access to networks and features by allowing users to set the following limits:

- number of tandem connections
- number of call redirections
- number of PSTNs; can be one or unlimited

- number of μ/A-law conversions
- number of satellite delays

These restrictions apply only within an ISDN environment. Limitations also prevent trunk lockup by allowing only one trunk without disconnect supervision to participate in a call connection. (Trunks providing disconnect supervision include CO/FX/WATS, CO, DID, TIE, CCSA, 2MB DTI trunks, and ISDN.) If multiple call transfers, conferences, or other situations cause two or more unsupervised trunks to be connected, call connection restrictions may not be effective.

Call connection restrictions override the Satellite Link Control feature. If the two features conflict (for example, Satellite Link Control limits satellite hops to one and call connection restrictions permit five hops), call connection restrictions prevail.

Prompts in LD 15 permit configuration of Call Connection Restrictions.

LD 15 – Call Connection Restriction Implementation

REQ:	CHG	Change data.
TYPE:	NET	Networking Data.
CUST	xx	Customer number.
ISDN	YES	ISDN option; must be set to YES to see following call connection restriction prompts.
...		
- RCNT	0–(1)–5	Number of call redirections allowed in a call connection.
- PSTN	YES/(NO)	YES limits the number of PSTNs allowed in a call connection to 1. NO permits unlimited PSTNs.
- - TNDM	0–(15)–31	Number of tandem connections allowed in a call connection.

LD 15 – Call Connection Restriction Implementation

- - PCMC	0–(15)–31	Number of PCM (μ/A-law) conversions permitted in a network connection.
- - SATD	0–(1)–5	Number of satellite delays allowed in a network connection.

Software packages

The following tables list the software features and their corresponding packages.

Note 1: To upgrade current ISDN software, see *Software Conversion Procedures* (553-2001-320).

Note 2: Package 19 is required for receiving CLID or NCPND.

Note 3: Package 75, PBX interface, is not required for ISL (package 147), unless ISL is over DTI. For ISL over analog trunks, ESN # 2 or 3 signaling is required. ESN # 5 signaling can be used if package 75 is installed.

Note 4: CDP (package 59) requires packages 28 and 61. Packages 28 and 61 are not required for NARS (package 58).

Note 5: If the user dials a Location code, package 58 must be equipped at the originating and the receiving Meridian 1. If CDP is used, package 59 needs to be equipped at both sites.

Note 6: Package 117 is also required in ISA configurations.

Note 7: Multi-purpose Serial Data Link (MSDL) cards (NT6D80) require package 222 for D-channel (and Application Module Link) operations.

Software and hardware compatibility

The different configurations within an ISDN environment are supported by different sets of features and services. As ISDN evolves, more and varied configurations are supported. These different configurations have their own software and hardware dependencies, as listed in the following tables.

Table 124
Software packages (Part 1 of 3)

Features	Package dependencies
64 Kbps Clear Data Transport	75, 145, 146
Attendant Blocking of Directory Number (ABDN)	14, 28, 32, 58, 75, 127, 145, 146 or 147, 159
Attendant and Network Wide Remote Call Forward	1, 18, 58, 59, 73, 139, 145
Backup D-channel	75, 145, 146 or 147
Basic Call Service	75, 145, 146 or 147
Call Forward, Break-In, Hunt Internal or External Network Wide	159, 263
Call Page Network Wide	307
Call Park Network Wide	306, 159, 33
Calling Line Identification (CLID)	19, 75, 145, 146 or 147
CLID in CDR record	4, 5, or 6, 118, 75, 145, 146 or 147
AT&T 4ESS	75, 145, 146
Custom AT&T 5ESS	75, 145, 146, 149
Custom DMS100	75, 145, 146
Data Packet Network (DPN) access	75, 145, 146
Display of Calling Party Denied	95, 145, 159
DTI Backwards Compatibility	75
DTI with Extended Superframe (ESF)	75, 145, 146
E.164/ESN Numbering Plan Expansion	19, 57, 58, 145, 146, 147, 160, 203, 216, 222, 235, 263
ESN over ISL or Primary Rate Interface	14, 32, 37, 39, 58 or 59, 75, 145, 146
Integrated Services Access (ISA)	75, 117, 145, 146

Table 124
Software packages (Part 2 of 3)

Features	Package dependencies
Integrated Trunk Access (ITA)	75, 145, 146
ISDN CLID Enhancements	145
ISDN Signaling Link (ISL)	75, 145, 147
Local trunk queuing over PRI/ISL (offhook or call back queuing)	14, 28, 32, 37, 58 or 59, 62, 75, 145, 146 or 147
Meridian Mail Trunk Restriction	46
Multi-purpose Serial Data Link (MSDL)	222
NCOS over ISDN Signaling Link (ISL)	14, 32, 37, 39, 58 or 59, 75, 145, 147
NCOS over Primary Rate Interface to Custom DMS-100	14, 32, 37, 39, 58 or 59, 75, 145, 146
National ISDN-2 (NI-2)	145, 146, 222, 291
Network Attendant Service (NAS)	14, 28, 32, 58, 59, 61, 75, 127, 145, 146 or 147, 148, 159, 161, 192
Network Call Forwarding	14, 32, 58 or 59, 75, 145, 146 or 147
Network Call Party Name Display (NCPND)	19, 75, 95, 145, 146 or 147
Network Call Redirection (NCRD)	145, 146 or 147
Network Message Services (NMS)	14, 32, 58 or 59, 75, 77, 145, 146 or 147, 148, 175
Network Ring Again (NRAG)	14, 32, 58 or 59, 75, 145, 146 or 147,148
Network Wide Listed Directory Numbers	14, 32, 58, 75, 76, 145, 146 or 147, 159
Non-Associated Signaling (nB +D)	75, 145, 146 or 147
PRI to DMS-250 or AT&T 4ESS	75, 145, 146, 149
Private Network Hopoff and Overflow	14, 28, 32, 58 or 59, 61, 75, 145, 146 or 147
QSIG Basic Call	263, 19, 145, 146, 222

Table 124
Software packages (Part 3 of 3)

Features	Package dependencies
QSIG Call Completion	263, 305, 316
QSIG GF Transport	263, 305
QSIG Name Display	19, 95, 139, 263, 305
Remote Virtual Queuing	192
T-1 Frame Slippage Auto-recovery	75, 145, 146
Trunk Anti-Tromboning	312, 145, 146 or 147, 148, 222
Trunk Optimization (TRO)	145, 146 or 147, 148
VNS VDN Expansion	14, 32, 58, 145, 146, 147, 148, 161, 183

The tables in this section describe the following configurations:

- Meridian 1 software and hardware compatibility
- Meridian 1 connectivity to SL-100, Custom DMS-100, and DMS-250, with software and hardware compatibility
- Meridian 1 connectivity to AT&T 4ESS and Custom AT&T 5ESS software and hardware compatibility
- Meridian 1 connectivity to National ISDN-2 (NI-2) software and hardware compatibility

Conventions within the following tables are:

- LF = limited functionality (the two items do interact, but call functions are somewhat limited compared to a different configuration)
- N = no, or “not supported”
- - = not applicable, or it does not apply to this configuration
- NR = not recommended for this configuration
- Y = yes, it is supported

Table 125
Meridian 1 software and hardware compatibility (Part 1 of 4)

Features	720A	720B	720C/E*	720F**	757A	757B	757C	757D	757E	NT6D80AA***	NT6D80AB***	NT5D12 DDP****
***** The QPC720D was not introduced in North America (it is only used in Hong Kong.) ****** The QPC720F has been introduced to handle NI-2, and R22 and higher software features. ******* The NT6D80AA MSDL supports R18 - R20 inclusive. The NT6D80AB supports R21 and higher. ******* Includes the NTBK51AA Downloadable D-Channel Daughterboard.												
Attendant Blocking of DN	N	N	Y	Y	N	N	N	N	N	N	Y	Y
Attendant Netwide RCFW	N	N	Y	Y	N	N	N	N	N	Y	Y	Y
Att/Net RCFW	N	N	Y	Y	N	N	N	N	N	Y	Y	Y
Backup D-channel	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y
Basic Call Service	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
CFW, Break-In, Hunt Internal, External Netwide	N	N	Y	Y	N	N	N	N	N	N	Y	Y
CFW/Hunt Override FFC	N	N	Y	Y	N	N	Y	Y	Y	N	Y	Y
Call Page Netwide	N	N	Y	Y	N	N	N	Y	Y	N	Y	Y
Call Park Netwide	N	N	Y	Y	N	N	N	N	N	N	Y	Y
Call Pickup Network Wide	N	N	Y	Y	N	N	N	N	N	N	Y	Y
Calling Line ID	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Calling Party Privacy	N	N	Y	Y	N	N	Y	N	N	N	Y	Y
CLID in CDR	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Table 125
Meridian 1 software and hardware compatibility (Part 2 of 4)

Features	720A	720B	720C/E*	720F**	757A	757B	757C	757D	757E	NT6D80AA***	NT6D80AB***	NT5D12 DDP****
DCH Error Report and Monitoring	Y	Y	Y	Y	N	N	N	N	Y	Y	Y	Y
DTI, ESF, CRC	Y	Y	Y	Y	-	-	-	-	-	-	-	-
Display of Calling Party Denied	N	N	Y	Y	N	N	N	N	Y	N	Y	Y
DTI Compatibility	Y	Y	Y	Y	-	-	-	-	-	-	-	Y
Electronic Lock Net/Private Line	N	N	Y	Y	N	N	N	N	Y	N	Y	Y
E.164/ESN Numb Plan Expansion	N	N	Y	Y	N	N	N	N	Y	N	Y	Y
ESN over PRI	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Incoming Trunk Program. CLID	N	N	Y	Y	N	N	N	N	N	N	Y	Y
ISDN CLID Enhancements	N	N	Y	Y	N	N	N	N	Y	N	Y	Y
ISL*	Y	Y	Y	Y	N	N	N	Y	Y	Y	Y	Y
ISL (Conventional)*	N	Y	Y	Y	N	N	N	Y	Y	Y	Y	Y
ITA	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Meridian Mail Trunk Restriction	N	N	Y	Y	N	N	N	N	N	N	Y	Y
NACD	N	Y	Y	Y	N	N	N	Y	Y	Y	Y	Y
NAS	N	N	Y	Y	N	N	N	N	Y	Y	Y	Y

Table 125
Meridian 1 software and hardware compatibility (Part 3 of 4)

Features	720A	720B	720C/E*	720F**	757A	757B	757C	757D	757E	NT6D80AA***	NT6D80AB***	NT5D12 DDP****
National ISDN 2 TR-1268 PRI	N	N	N	Y	N	N	N	N	N	N	Y	Y
***** Features must be compatible with the transport.												
nB + D	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
NCPND	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
NND	Y	Y	Y	Y	N	N	N	N	Y	Y	Y	Y
NCRD												Y
— NCFAC	N	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y
— NCFB	N	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y
— NCFNA	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y
— NHNT	N	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y
NWLDN	N	N	Y	Y	N	N	Y	Y	Y	Y	Y	Y
— NXFER	N	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y
Network Call Trace	N	Y	Y	Y	N	N	N	N	Y	Y	Y	Y
Network Intercom	N	N	Y	Y	N	N	N	N	N	N	Y	Y
B8ZS	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
NMS-MC	N	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y
NMS-MM	N	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y
NRAG	N	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y
QSIG Basic Call	N	N	N	Y	N	N	N	N	N	N	Y	Y

Table 125
Meridian 1 software and hardware compatibility (Part 4 of 4)

Features	720A	720B	720C/E*	720F**	757A	757B	757C	757D	757E	NT6D80AA***	NT6D80AB***	NT5D12 DDP****
QSIG Call Completion	N	N	N	Y	N	N	N	N	N	N	Y	Y
QSIG GF Transport	N	N	N	Y	N	N	N	N	N	N	Y	Y
QSIG Name Display	N	N	N	Y	N	N	N	N	N	N	Y	Y
64 K Clear Data	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Remote Virtual Queuing	N	N	Y	Y	N	N	N	N	Y	Y	Y	Y
Trunk Anti-Tromboning	N	N	Y	Y	N	N	N	N	N	N	Y	Y
TRO	N	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y
T1 Frame Slip Auto-recovery*	N	Y	Y	Y	-	-	N	N	-	-	-	Y*
T309 Timer	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Virtual Network Services	N	N	Y	Y	N	N	N	N	Y	N	Y	Y
VNS VDN Expansion	N	N	Y	Y	N	N	N	N	Y	N	Y	Y

***** Without the NTBK51AA.

Table 126
Meridian 1 compatibility with connectivity to SL-100, Custom DMS-100, DMS-250 (Part 1 of 2)

Features	720A	720B	720C/E*	720F**	757A	757B	757C	757D	757E	NT6D80AA***	NT6D80AB***	NT5D12 DDP****
***** The QPC720D was not introduced in North America (it is only used in Hong Kong.) ****** The QPC720F has been introduced to handle NI-2, and R22 and higher software features. ******* The NT6D80AA MSDL supports R18 - R20 inclusive. The NT6D80AB supports R21 and higher. ******* Includes the NTBK51AA Downloadable D-Channel Daughterboard.												
Backup D-channel	N	Y	Y	Y	N	N	N	Y	Y	Y	Y	Y
nB+D	N	N	Y	Y	N	N	N	N	Y	Y	Y	Y
Basic Call Service	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Calling Line ID	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
CLID in CDR	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
DPN access	N	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y
DTI, ESF, CRC	Y	Y	Y	Y	-	-	-	-	-	-	-	-
DTI Compatibility	Y	Y	Y	Y	-	-	-	-	-	-	-	Y
ESN over PRI	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
ISA	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
NND	Y	Y	Y	Y	N	N	N	N	Y	Y	Y	Y
NCRD												Y
— NCFAC	N	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y

Table 126
Meridian 1 compatibility with connectivity to SL-100, Custom DMS-100, DMS-250 (Part 2 of 2)

Features	720A	720B	720C/E*	720F**	757A	757B	757C	757D	757E	NT6D80AA***	NT6D80AB***	NT5D12 DDP****
— NCFB	N	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y
— NCFNA	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y
— NHNT	N	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y
NRAG (TIE)	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y
B8ZS	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
NRAG	N	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y
64 K Clear Data	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Private Network Hopoff	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
T1 Frame Slip Auto-recovery*	N	Y	Y	Y	-	-	-	-	-	-	-	Y *

***** Without the NTBK51AA.

Table 127
Meridian 1 software and hardware compatibility with connectivity to AT&T 4ESS

Features	720A	720B	720C/E*	720F**	757A	757B	757C	757D	757E	NT6D80AA***	NT6D80AB***	NT5D12 DDP****
***** The QPC720D was not introduced in North America (it is only used in Hong Kong.) ****** The QPC720F has been introduced to handle NI-2, and R22 and higher software features. ******* The NT6D80AA MSDL supports R18 - R20 inclusive. The NT6D80AB supports R21 and higher. ******* Includes the NTBK51AA Downloadable D-Channel Daughterboard.												
ANI in CDR	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
ANI Station ID	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Backup D-channel	N	N	Y	Y	N	Y	Y	Y	Y	Y	Y	Y
Basic Call Service	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
ISA/CBC	N	Y	Y	Y	N	N	N	Y	Y	Y	Y	Y
DTI, ESF, CRC	Y	Y	Y	Y	-	-	-	-	-	-	-	-
nB+D	N	N	Y	Y	N	Y	Y	Y	Y	Y	Y	Y

Table 128
Meridian 1 software and hardware compatibility with connectivity to Custom AT&T 5ESS

Features	720A	720B	720C/E*	720F**	757A	757B	757C	757D	757E	NT6D80AA***	NT6D80AB***	NT5D12 DDP****
***** The QPC720D was not introduced in North America (it is only used in Hong Kong.) ****** The QPC720F has been introduced to handle NI-2, and R22 and higher software features. ******* The NT6D80AA MSDL supports R18 - R20 inclusive. The NT6D80AB supports R21 and higher. ******* Includes the NTBK51AA Downloadable D-Channel Daughterboard.												
ANI Station ID	N	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y
Basic Call Service	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
ISA/CBC	N	Y	Y	Y	N	N	N	N	Y	Y	Y	Y

Table 129
Meridian 1 software and hardware compatibility with NI-2

Features	720A	720B	720C/E*	720F**	757A	757B	757C	757D	757E	NT6D80AA***	NT6D80AB***	NT5D12 DDP****
***** The QPC720D was not introduced in North America (it is only used in Hong Kong.) ****** The QPC720F has been introduced to handle NI-2, and R22 and higher software features. ******* The NT6D80AA MSDL supports R18 - R20 inclusive. The NT6D80AB supports R21 and higher. ******* Includes the NTBK51AA Downloadable D-Channel Daughterboard.												
Bearer capability	N	N	N	Y	N	N	N	N	N	N	Y	Y
Basic Call Service	N	N	N	Y	N	N	N	N	N	N	Y	Y
Calling Party Number	N	N	N	Y	N	N	N	N	N	N	Y	Y
nB+D	N	N	N	Y	N	N	N	N	N	N	Y	Y
Backup D-channel	N	N	N	Y	N	N	N	N	N	N	Y	Y

Table 130
Meridian 1 software and hardware compatibility

Services	720A	720B	720C	757A	757B	757C	757D	757E	MSDL
QPC720A	Y	LF	LF	Y	Y	LF	LF	LF	N
QPC720B	LF	Y	LF	N	LF	Y	Y	Y	N
QPC720C/E	LF	LF	Y	N	LF	Y	Y	Y	Y
QPC720F	LF	LF	Y	N	LF	Y	Y	Y	Y
QPC757A	Y	N	N	Y	LF	LF	LF	LF	LF
QPC757B	Y	LF	LF	LF	Y	LF	LF	LF	LF
QPC757C	LF	Y	Y	LF	LF	Y	LF	LF	LF
QPC757D	LF	Y	Y	LF	LF	LF	Y	LF	LF
QPC757E	LF	Y	Y	LF	LF	LF	LF	Y	LF
NT6D80 (MSDL)	N	N	Y	N	N	N	Y	Y	Y
NT5D12/w NTBK51AA	LF	LF	Y	N	LF	Y	Y	Y	Y

Y = (supported); N = not supported; NR = not recommended; LF = limited functionality (items interact, but call functions could be limited)

Meridian 1 connectivity

ISDN signaling connectivity is supported between Meridian 1 and the following products:

- Meridian 1
- SL-100
- Custom DMS-100 and DMS-250
- AT&T 4ESS
- Custom AT&T 5ESS

Central Office connectivity:

- Asia Pacific, consisting of:
  - Australia (private or alternative carrier)
  - China
  - Hong Kong
  - India
  - Indonesia
  - Japan
  - Malaysia
  - New Zealand
  - Philippines
  - Singapore
  - Taiwan
  - Thailand
- Australia ETSI
- AXE-10 Australia (non-Asia Pacific ISDN Connectivity)
- AXE-10 (Sweden)
- EuroISDN
- Japan D70 (non-Asia Pacific ISDN Connectivity)

- NEAX-61 (New Zealand) (non-Asia Pacific ISDN Connectivity)
- Numeris VN3 (France)
- SwissNet (Switzerland)
- SYS-12 (Norway)
- 1TR6 (Germany)

Cable information

The following lists contain cable and channel information. The cable type used is a 2-pair twisted wire.

- 655 ft (200 m) Meridian 1 to DSX-1 cross-connect point (using ARAM or ABAM equivalent shielded cable)
- 750 ft (229 m) from Meridian 1 to Office Repeater Bay

Specific cables are detailed in *ISDN PRI: Installation* (553-2901-201).

Service verification

Contents

The following are the topics in this section:

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PRI local loop back test 1800
PRI self-test 1801
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ISDN Signaling Link (Meridian 1 to Meridian 1 connection only) 1814

Reference list

The following are the references in this section:

Multi-Purpose Serial Data Link: Description (553-3001-195)

Testing PRI

There are four tests used to test the Primary Rate Interface:

- the PRI local loop back test
- a PRI self-test performed manually
- the PRI automatic loop test
- the PRI remote loop-back test (must run in conjunction with a link diagnostic test at the far end)

PRI local loop back test

This test checks the communication path between the QPC414 Network card and the PRI card. It also checks the leads for the J4. It is often performed when the PRI cannot be enabled. The PRI card must be installed, and a cable connecting its J3 connector to a QPC414 Network card.

1 Disable the D-channel.

LD 96
DIS DCH x

2 Disable the PRI loop:

LD 60
DISL loop

3 Disconnect the cable connector from the PRI J4 (if attached). Several LEDs will light on the faceplate.

4 Attach a female 15 pin connector loopback plug to J4. The loopback plug must have pins 1 and 3, and pins 9 and 11 shorted together.

5 Enable the PRI loop:

LD 60
ENLL loop

The green ACT LED will light in a few seconds. If so, the test passed. Continue with the following steps.

If the green ACT light does not come on, retest. Unseat the PRI card between steps 2 and 3.

If the light still does not turn on, try replacing your QPC414 or PRI cards, or the connecting cable.

6 Remove the loopback plug from the J4 connector.

7 Replace cable connector to the PRI J4 (removed in step 3).

8 Enable the loop:

LD 60
ENLL loop

9 Enable the DCH:

LD 96
ENL DCH x

PRI self-test

The self-test checks speech path continuity, zero code suppression, remote alarm detection, and A&B bit signaling. This test is performed manually, on a per channel or a per frame (24 channels) basis.

The DCH and PRI must be disabled before performing the self-test or call processing is disrupted. To perform the self-test on a specific loop:

1 Disable DCH:

LD 96
DIS DCH x

2 Disable the PRI loop and run the self-test:

LD60
DISL loop
SLFT loop

When the system returns OK, it indicates that the hardware is operable.

3 Re-enable the PRI loop:

LD 60
ENLL loop

The D-channel will re-enable automatically.

PRI automatic loop test

The automatic loop test checks the same functions as the self-test. Unlike the self-test, it can be run automatically, as part of the midnight routines.

With the ATLP command set to one:

If all 23 channels are idle at midnight, the system disables the card and performs a self-test on all channels.

If any of the 23 channels are busy at midnight, the system disables one idle channel, chosen at random, and checks it while the card is enabled.

With the ATLP command set to zero, only one channel is tested. The channel tested is randomly selected by software; it cannot be specified.

To perform the remote loop-back test, use the following:

LD 60
ATLP 1 or 0

When ATLP 1 is entered, the TTY prints out AUTO TEST ENBL. When ATLP 0 is entered, the TTY prints out AUTO TEST DSBL.

Link diagnostic and remote loop-back tests

The remote loop-back test and the link diagnostic test are performed manually on a per channel or a per frame (23 channels) basis.

Link diagnostic test

The link diagnostic test, also called the far end loop-back test, does not test the Meridian 1 PRI. It puts the PRI in loop-back mode at the far end so a remote loop-back test can be performed on far end equipment. The PRI channel, loop, or frame tested must be disabled.

Remote loop-back test

The remote loop-back test, also called the near end loop back test, checks the integrity of the PRI from the Meridian 1 system to the far end. The far end must be put into loop-back mode before this test can be performed. The PRI channel, loop, or frame tested must be disabled.

Coordinating the tests

When a technician at the far end asks for loop-back mode on the Meridian 1, perform the following steps.

1 Disable the D-channel.

LD 96
DIS DCH x

2 Disable the PRI loop and activate loop-back mode.

LD 60
DISL loop
RLBK loop
The QPC720 LBK LED lights.

When a technician at the far end asks for loop-back mode on the Meridian 1 to be disabled, perform this step.

Disable loopback mode.

LD 60
DLBK loop
The LBK LED turns off.

When a technician at the far end asks for PRI and DCH to be re-enabled, perform this step.

Enable the PRI loop.
LD 60
ENLL loop
OK will print out. The D-channel re-enables automatically.

To run the remote loop-back test on the Meridian 1, call a technician at the far end and ask for loop-back mode at that facility.

When loop-back mode at the far end is confirmed, the technician at the far end follows these steps.

1 Disable the D-channel.

LD 96
DIS DCH N

2 Disable the PRI loop and run the loop-back test using.

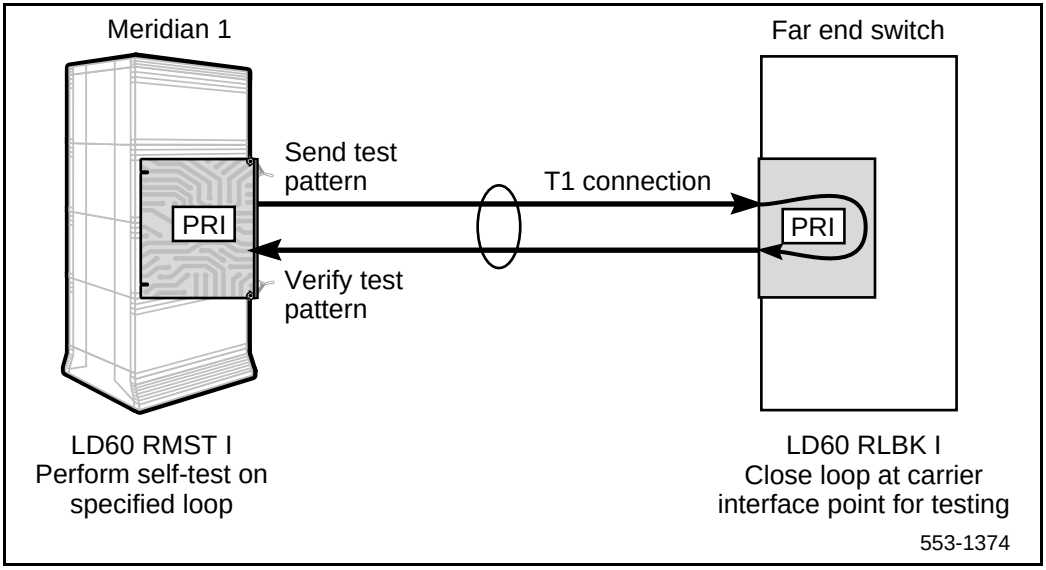
LD 60
DISL L
RMST L
SLFT OK prints out to indicate a successful test.

3 Call the far end technician to disable the loopback test, and to re-enable the PRI and DCH. The far end technician enables the PRI.

LD 60
ENLL L
OK prints out, and the D-channel re-enables automatically.

Figure 185 shows the relationship between the remote loop-back test and the link diagnostic test.

Figure 185
PRI remote loop-back and link diagnostic tests



Testing DCH

This chapter describes the following DCH tests. These tests are supported on the QPC757, NT6D11AB, NT6D11AD DCHI cards. MSDL card (NT6D80) tests are shown later in this chapter.

- Test 100: Interrupt generation
- Test 101: Loop-back mode
- Test 200: Interrupt handler
- Test 201: Interrupt handler-to-link interface

DCH tests 100 and 101

DCH tests 100 and 101 are isolated hardware tests. Test 100 checks interrupt generation on the DCHI card. Test 101 checks the DCHI loop-back capability. If either test fails, either a faulty DCHI or a contention problem is indicated. A test failure initiates DCH error messages. See Figure 186.

Tests 100 and 101 must be run in sequential order (tests 200 and 201 may follow). Established calls stay up, but new calls cannot be placed.

The DCH link must be in the reset state when these tests are run. Reset can be accomplished when the status of the D-channel is established (EST) or released (RLS).

To reset:
LD 96
STAT DCH x (responds either EST or RLS)
RST DCH x

If the DCHI is disabled, it must be enabled before reset can be established.

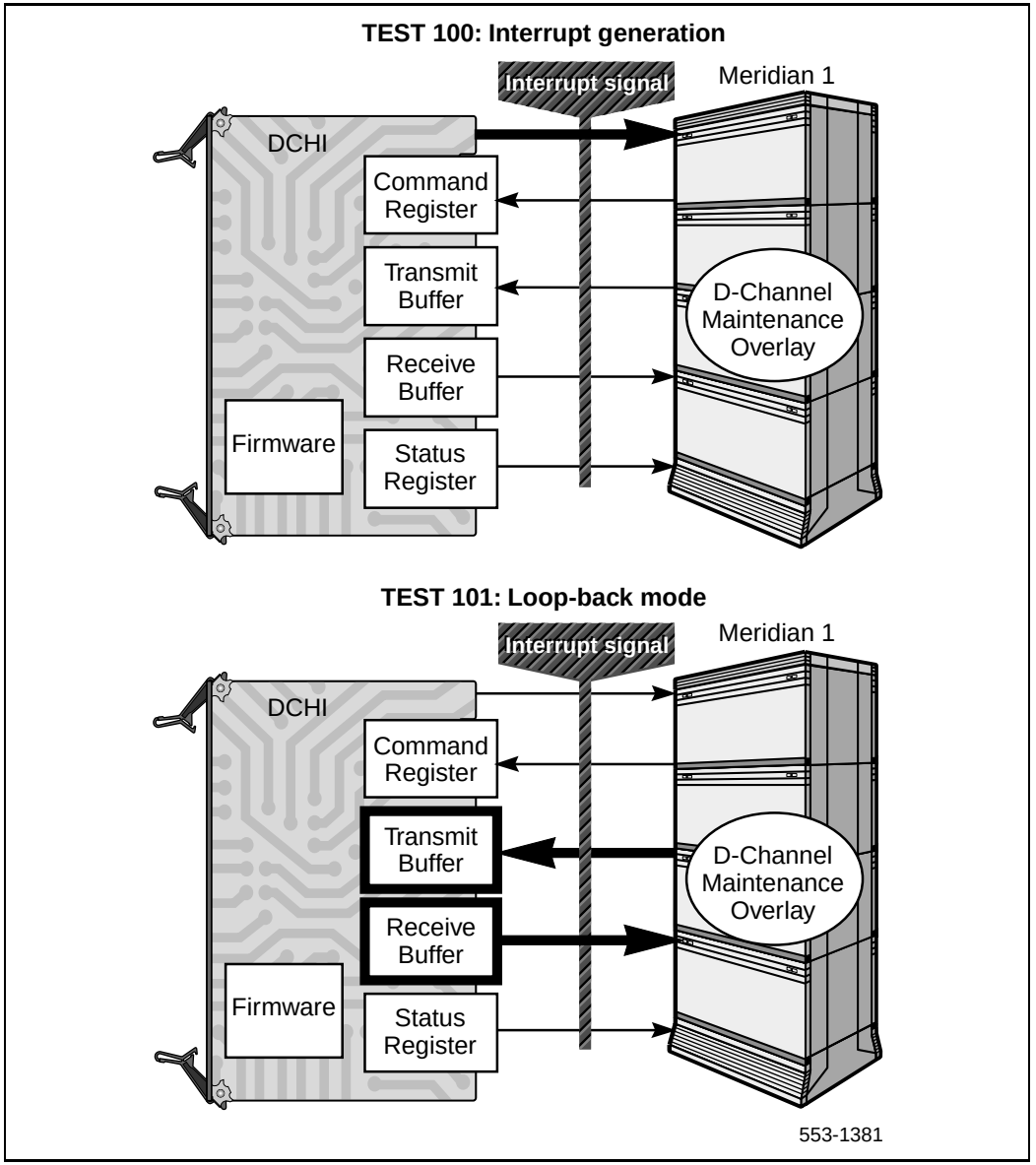
To enable the DCHI:

LD 96
STAT DCH x (responds RST)
ENL DCH x (if a problem caused the disabled state, RLS occurs; if the disabled state is cleared, status is EST)

To run Test 100 and Test 101 after verifying that the DCH is reset:

TEST 100 x
TEST 101 x
OK appears when test passes successfully.

Figure 186
DCH tests 100 and 101



DCH tests 200 and 201

DCH tests 200 and 201 are software tests. See Figure 187. Test 200 monitors the DCHI interrupt handler. Test 201 checks the interrupt handler-to-link interface path. A failure of either test indicates software problems. A test failure initiates DCH error messages.

Tests 200 and 201 must be run sequentially after tests 100 and 101. Established calls stay up, but new calls cannot be placed.

The DCH link must be in the reset state when these tests are run. Reset can be established when the status of the D-channel is established (EST) or released (RLS).

To reset:

LD 96
STAT DCH x (responds either EST or RLS)
RST DCH x

If the DCHI is disabled, it must be enabled before reset can be established.

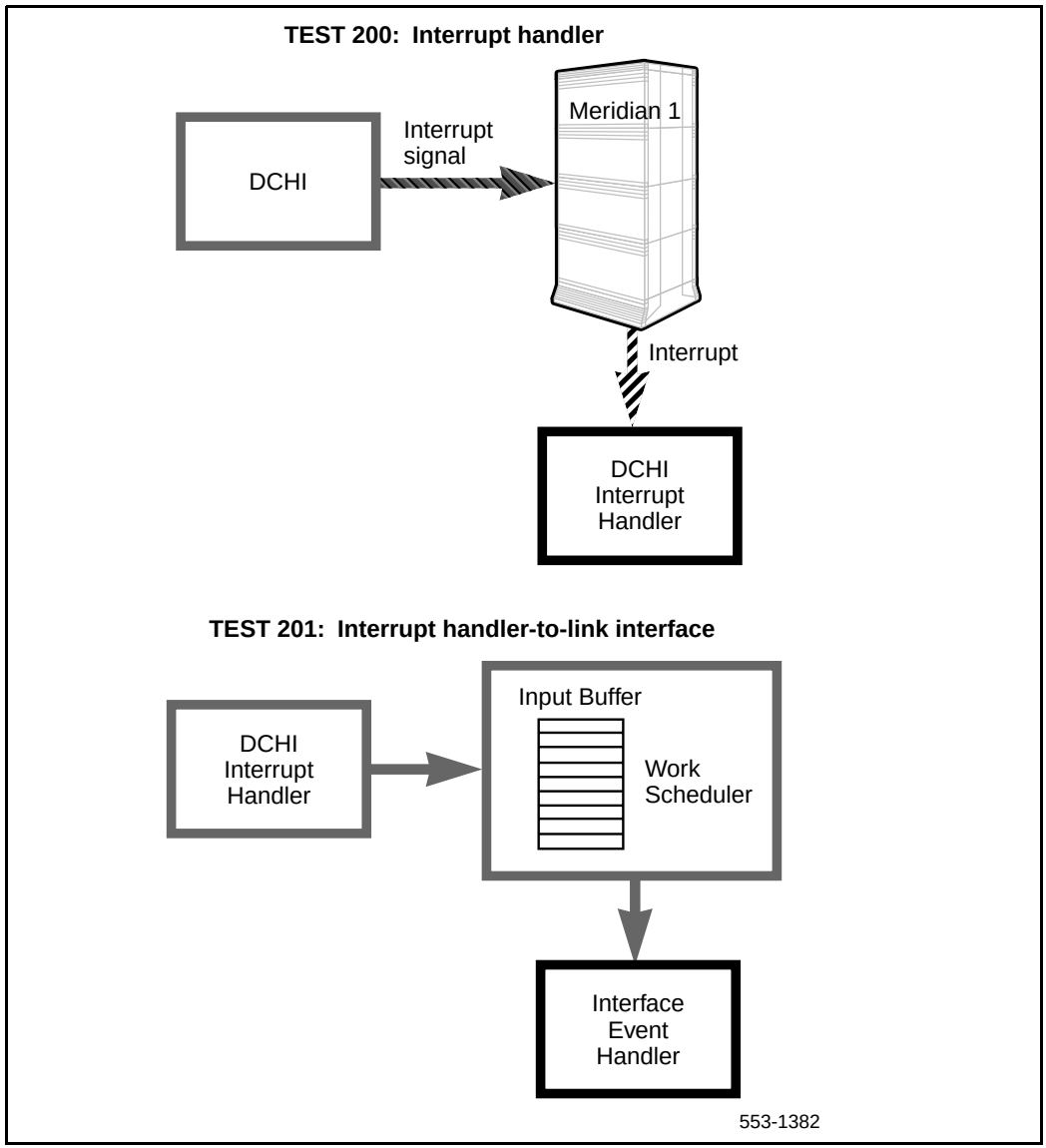
To enable the DCHI:

LD 96
STAT DCH x (responds RST)
ENL DCH x (if a problem caused the disabled state, RLS occurs; if the disabled state is cleared, status is EST)
RST DCH x

To run Test 200 and Test 201 after verifying that the DCH is reset:

TEST 200 x
TEST 201 x
OK appears when test passes successfully.

Figure 187
DCH tests 200 and 201



MSDL local loopback test (NT6D80)

To start the local loopback test on the MSDL card, use the following steps. The test checks both MSDL expedited and normal (ring) interfaces.

1 Place MSDL in Test state. Enter
ENL TEST DCH xx = the D-channel logical address

2 Place the MSDL in local loopback mode. Enter
ENL LLB DCH xx = the D-channel logical address

3 Perform the test. Enter
TEST LLB DCH xx = the D-channel logical address

The response for the expedited interface that carries urgent signaling and maintenance messages between the Meridian 1 CPU and the MSDL MPU follows.

DCH : X XDU TEST CONFIRM TIME : <time of day>
TEST : PASS (or FAIL)

X is the D-channel logical address
XDU is the expedient message sent around the loop.

The response for the ring interface that transmits operation data between the Meridian 1 CPU and the MSDL MPU follows.

DCH : X DU TEST CONFIRM TIME : <time of day>
TEST : PASS (or FAIL)

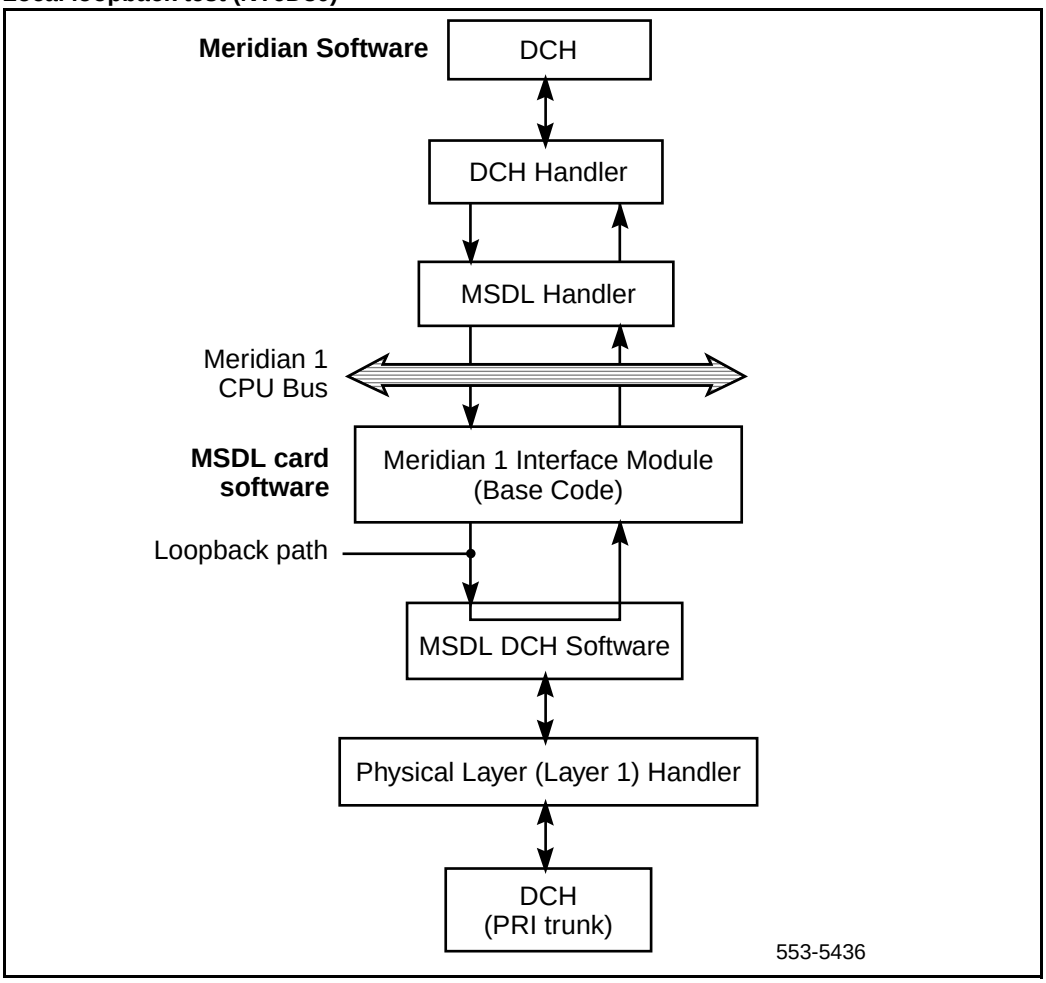
1 If the test fails, check the status of the MSDL card, used by this DCH link, with the **STAT MSDL x FULL** command.

2 If the MSDL card may be faulty, disable the card and perform self-test.
DIS MSDL x x = the MSDL device number
SLFT MSDL xx = the MSDL device number

3 If the card passed the test, the problem may lie in incompatible software.

Refer to *Multi-Purpose Serial Data Link: Description* (553-3001-195).

Figure 188
Local loopback test (NT6D80)



MSDL remote loopback tests (NT6D80)

Before beginning this test, verify the following.

- D-channels on both switches are configured on MSDL cards
- DCH links on both switches are set to TEST mode

- DCH at Switch B is in remote loopback mode (RLB)
- remote capability (RCAP) is MSDL

To place DCH links on both systems in TEST mode, enter **ENL TEST DCH x** on Switch A and **ENL TEST DCH y** on Switch B for the same DCH link (**x** is the logical address for the DCH link in Switch A and **y** is the corresponding DCH link in Switch B). The DCH link on both switches are automatically placed in idle state (IDLE).

1 Place the Switch B DCH link in remote loopback state (RLB) with **ENL RLB DCH x**. The DCH link in Switch A must stay in idle.

2 From Switch A, perform the loopback test with **TESTRLB x**.

The result of the remote loopback test is displayed on Switch A's console in the following format.

DCH : X RLB TEST CONFIRM TIME : <time of day>
TEST : PASS
TEST : FAIL - NO DATA RCV FAR END
TEST : FAIL - CORPT DATA RCV FAR END
TEST : FAIL - REASON UNKNOWN

TEST : FAIL may indicate a problem in the physical link between the two switches, or faulty equipment in either switch. Check the connections, and verify the status of the MSDL and PRI trunk cards used for this link. Refer to *ISDN PRI maintenance* (553-2901-500) for detailed troubleshooting procedures.

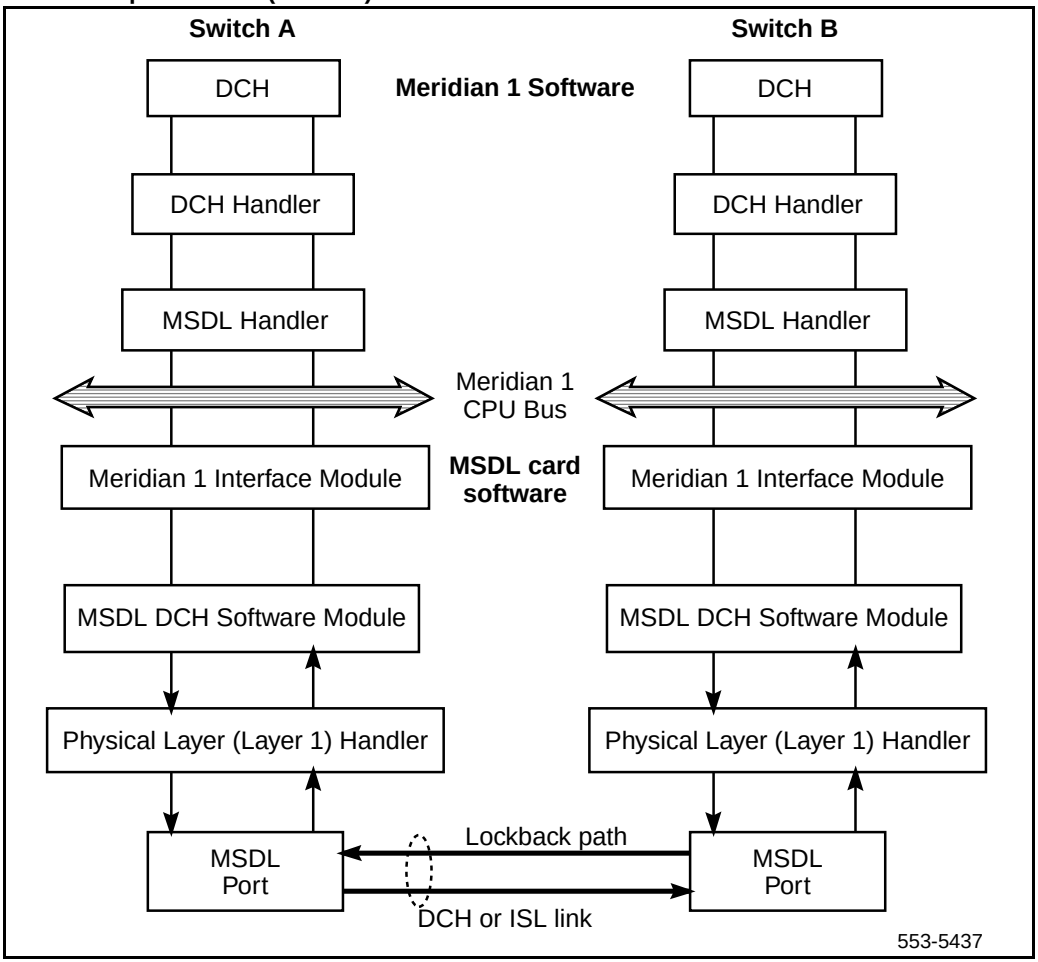
3 Place the Switch B DCH link back to the idle state, with the **DIS RLB y** command.

4 If you think the MSDL card used in either switch has failed, check the status of the DCH link and the status of the MSDL card by entering **STAT MSDL x FULL**.

5 If the MSDL card may be faulty, disable the card and perform self-test.
DIS MSDL x
SLFT MSDL x

6 If the card passed the test, the problem may lie in incompatible software. Refer to *Multi-Purpose Serial Data Link: Description* (553-3001-195).

Figure 189
Remote loopback tests (NT6D80)



Testing applications

Calling Line Identification

To verify Calling Line Identification (CLID), do the following:

1. Place a call from the Meridian 1 over a PRI trunk to a terminal with a digit display at the far-end facility.
2. Verify that the call is terminated correctly.
3. Verify that the CLID number displayed on the far-end set is correct.
4. Have the far end place a call to a Meridian 1 device with a digit display.
5. Verify that the number displayed is the correct CLID number.
6. Verify that the call can be released properly from either end.

Network Call Redirection (Meridian 1 to Meridian 1 connection only)

To verify Network Call Redirection (NCRD), do the following:

1. Place a call from the Meridian 1 over a PRI trunk to a digit display set at a far-end facility. This far-end facility must be on a different network.
2. To ensure that network redirection takes place, the first dialed number must be in an NCFNA or NCFU condition.
3. Verify that the call is terminated correctly.
4. Verify that the CLID display of the calling party contains the following:
   - Originally called party DN (or redirecting DN)
   - Connected Party DN
   - Reason for redirection
   - Connected Party Name
5. Verify that the CLID display of the connected party contains the following information:
   - Calling party DN
   - Originally called party DN (or redirecting DN)
   - Reason for redirection
   - Calling Party Name

6 Verify that the call can be released properly from either end.

7 Then have the far end place a call that is redirected. Then repeat steps 4 and 5.

Network Ring Again (Meridian 1 to Meridian 1 connection only)

To verify Network Ring Again (NRAG), do the following:

1 Coordinate with far-end personnel. Place a call to a busy station at the far end over a PRI trunk.

2 Verify that the calling terminal can activate NRAG and that any ring again indicator lamps are lit.

3 When the far-end call disconnects, verify that the calling terminal is notified.

4 Verify that the far-end number can be dialed through NRAG access.

5 Test the timeout period with far-end personnel.

6 Verify that NRAG can be manually deactivated by the calling terminal.

ISDN Signaling Link (Meridian 1 to Meridian 1 connection only)

To verify the ISDN Signaling Link, do the following:

1 Coordinate with far-end personnel. Place a call over a Meridian 1 switch.

2 As you are dialing, the dialed DN appears on your set.

3 When the far-end set is ringing, the CLID of your set is displayed on the far-end set.

4 Both sets continue to display the CLIDs when the far end goes off hook.

Meridian 1 and Succession Communication Server for Enterprise 1000

International ISDN Primary Rate Interface

Feature description and administration

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